The Journal of the American Medical Association

VOL. XXIII. CHICAGO, AUGUST 4, 1894. No. 5.

ADDRESS.

CHAIRMAN'S ADDRESS.

Read in the Section on Obstetrics and Diseases of Women, at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5-8, 1894.

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It seems best on this occasion to turn aside from the usual custom of reporting progress in the Department of Obstetrics and Gynecology, a subject which has been so often and ably presented and discussed by my predecessors, and call your attention to the present status of suprapubic hysterectomy as viewed from the standpoint of personal observation and clinical research, with the hope that I may contribute in some small measure to the profitable discussion which I am quite sure will follow the reading of the valuable papers on your program.

It is not my intention to report a series of operations made for the removal of symmetrically formed pear-shaped tumors, with well-defined broad ligaments, with uterine arteries easily accessible and seen pulsating in their anxiety to be ligated; tumor, ligaments and arteries dealt with by some definite method; each operation made in exactly so many minutes; and all the patients making uneventful recoveries. The literature of the subject is already cursed with such productions. Therefore, I would rather suggest such means and methods as experience has taught me will furnish the best possible results in dealing with tumors by no means symmetrically formed; with broad ligaments displaced and disorganized by nodular masses interfering with the ligation of arteries and the easy formation of pedicles.

Despite the efforts of some to name a distinct method of operating because a flap is made here, or a ligature placed there, the problems of suprapubic hysterectomy are rapidly nearing their solution. Those engaged in the work are divided into two classes: Those who have been and are yet satisfied with forming a pedicle and fixing the same in the abdominal wound; and those who were not satisfied that this method was the best that could be devised, and have been earnestly endeavoring to reach some method which shall disregard the morphology of tumor, of broad ligaments, and the location of uterine arteries.

On Feb. 3, 1887, knowing full well that abdominal fixation of the pedicle in suprapubic hysterectomy had at that time given the lowest rate of mortality, I decided *not* to operate in that way, but planned and executed an operation which in every essential feature was an extirpation of almost the entire cervix. A large cautery passed three times down through the cervix in reality destroyed a large portion of what little cervix I had left. A rubber drainage tube was inserted for vaginal drainage.

In a recent discussion in the *New York Journal of Obstetrics and Gynecology* they speak of the operations by Stimson, Krug, Baer and myself as if they were all operations of total ablation of the uterus. If these operations are to be considered, then the operation of Stimson in November, 1888, was antedated by my determination to secure something better than the abdominal fixation of the pedicle, on Feb. 3, 1887.

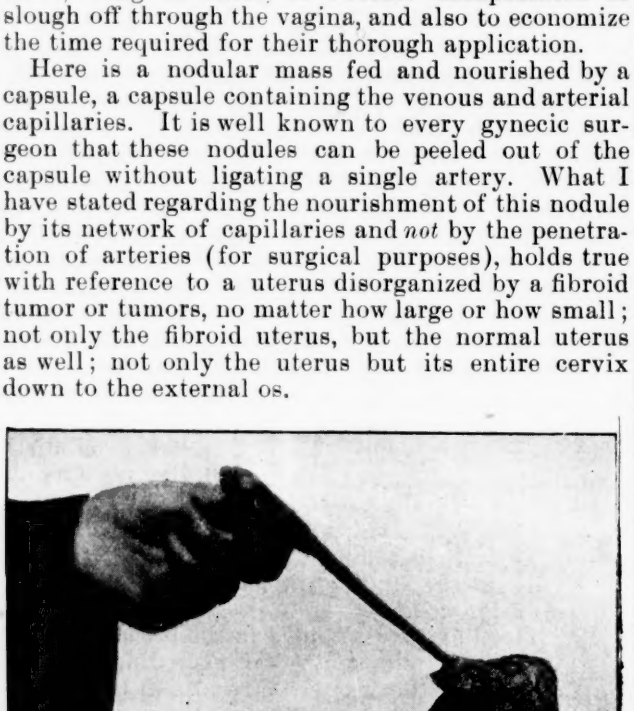
It is not my purpose to occupy time in discussing questions of priority in making an operation, although the operation, including the use of my hysterectomy staff, as I demonstrated it at the International Medical Congress in Berlin, has since been made many times by Krobak, of Vienna, and numerous American operators with great satisfaction, and while I have received many congratulatory letters from distinguished operators on account of the rapidity and definiteness of the operation made possible by the use of the staff, I have been working to still further simplify and perfect the operation.

I concede the fact that where a given fibroid tumor has no nodular masses in the region where we would form a pedicle, or imbedded in the broad ligaments, and where the abdomen is not exceedingly fat, that abdominal fixation has given results in the hands of expert operators in a very high degree satisfactory. So far as I have been enabled to read the writings of its warmest advocates, none of them have mentioned the very strongest point in its favor, namely, that in this method we have practically *one wound*, whereas in the total or partial extirpation method we have two wounds; the one in the abdomen, the other in the pelvis, the latter extending through connective tissue, rich in lymphatics, down to the vagina,—(an incubator for many varieties of bacteria,) which can not always be sterilized and maintained aseptic during an operation. Notwithstanding the strong points in favor of abdominal fixation of a pedicle, which I have mentioned, it has been the subject near my heart for nearly eight years to study out the anatomy and its displacements by pathologic neoplasms, and perfect a method as speedy of execution, followed by as successful results, as any or all other methods,—a method applicable not only to tumors where a pedicle for abdominal fixation could be formed, but also to those cases *where nodular masses* have *completely disorganized the cervix*, and *intraligamentous masses are found* in the *broad ligaments* of one or both sides.

I became well convinced a number of years ago that the use of the clamp of Keith or the serre-nœud of Koeberle for controlling hemorrhage from the neck of the uterus, was based upon the idea that the spiral or curling branches given off from the uterine arteries really penetrated the tissues of the uterus including its cervix. Some seven text-books on anatomy which I have examined state that these branches penetrate the uterus. I have a number of times, with fingers on the broad ligaments and their contained

vessels, cut directly through, seizing the spurting vessel and securing it later. Many times a single uterine artery has been ligated in many places in its zigzag course, the operator thinking he secured a distinct vessel each time. I have also peeled off the uterine arteries from the sides of the uterus and then cut off the cervix with little or no hemorrhage. This was for the purpose of reducing the number of ligatures,[1] long or short, to become incapsulated or slough off through the vagina, and also to economize the time required for their thorough application.

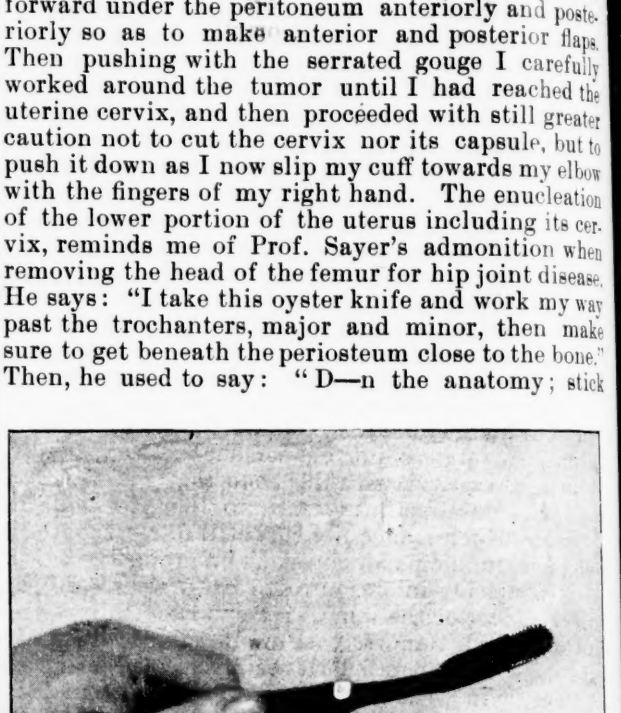
Here is a nodular mass fed and nourished by a capsule, a capsule containing the venous and arterial capillaries. It is well known to every gynecic surgeon that these nodules can be peeled out of the capsule without ligating a single artery. What I have stated regarding the nourishment of this nodule by its network of capillaries and *not* by the penetration of arteries (for surgical purposes), holds true with reference to a uterus disorganized by a fibroid tumor or tumors, no matter how large or how small; not only the fibroid uterus, but the normal uterus as well; not only the uterus but its entire cervix down to the external os.



I here present a specimen (a photograph of which you may see in the *American Journal of Obstetrics and Diseases of Women* for the past month), and to my mind it marks a new era in the removal of fibroid tumors by hysterectomy for the reason that the uterine arteries were not ligated at all. I went down between the uterine arteries and the uterus. The uterine arteries were absolutely left in the pelvis of the woman, not a single ligature being used except those which tied off the ovarian arteries and a small portion of the upper border of the broad ligaments.[2]

Then in addition to solving the problem as to what to do with the pedicle, by deciding not to have any, we now solve the problem as to what to do with the broad ligaments and especially their contained uterine arteries by simply leaving them in the pelvis of the patient.

In this case I simply controlled the circulation in the ovarian artery by ligating the upper portion of the broad ligaments with a strong ligature, then cutting the broad ligaments above the ligature; began with the serrated gouge to peel down the broad ligaments, keeping the gouge close to the tumor, being especially careful in the interspaces between the nodules not to puncture or tear the uterine artery or any of its branches. From time to time nicking the edges of the peritoneum with these button pointed scissors, with the serrated cutting edge I pushed it forward under the peritoneum anteriorly and posteriorly so as to make anterior and posterior flaps. Then pushing with the serrated gouge I carefully worked around the tumor until I had reached the uterine cervix, and then proceeded with still greater caution not to cut the cervix nor its capsule, but to push it down as I now slip my cuff towards my elbow with the fingers of my right hand. The enucleation of the lower portion of the uterus including its cervix, reminds me of Prof. Sayer's admonition when removing the head of the femur for hip joint disease. He says: "I take this oyster knife and work my way past the trochanters, major and minor, then make sure to get beneath the periosteum close to the bone." Then, he used to say: "D—n the anatomy; stick



close to the bone," and proceeded in peeling off the periosteum until he had the entire head of the femur out of the acetabulum.

As I reached the lower portion of the cervix my hysterectomy staff was passed up the vagina by my son, Dr. Thomas B. Eastman. I then removed the entire cervix, cutting a little opening on to the staff, slipping a strip of gauze in the fenestra of the staff. When the staff was withdrawn this was brought down in the vagina, the upper portion of the gauze being packed into the pocket from which the cervix had been enucleated. The flaps which I had dissected off from the tumor and cervix were brought together by buried suture over the ligatures which had included the ovarian arteries so that their raw ends also came into the wound. Several rows of buried suture were used so that all raw edges made by peeling out the cervix were deeply buried and prevented leaking into the peritoneal cavity, the gauze being dragged down into the vagina a little each day, facilitating perfect drainage in that direction. This operation is the *realization of the ideal.* Heretofore all of us had simply been *idealizing the real.* In my lecture delivered to the Post-Graduate School of Chicago in July, 1893, I closed with a series of conclusions. From them I quote the third, to-wit: "Where the

[1] A ligature to secure the uterine arteries will often secure a certain amount of muscular and connective tissue and is one of the possible sources of infection of the wound, hence the importance of having as few ligatures as possible.

[2] Sauter, three-quarters of a century ago, removed the uterus per vagina, without clamp or ligature. (See article by Dr. Guido Bell, Indiana Medical Journal, February, 1894.) Further, the enucleation of the cervix per vagina was made by Langbeck in 1813, by Recamier in 1829, and by Malgaigne at a later date. (See article by Dr. Robert Reyburn.)

neck of the uterus remains small, abdomen not too fat, after the ovaries and tubes have been tied off, the pedicle may be fastened in the lower angle of the wound and give satisfactory results." To this conclusion stated at that time I have this to add: Where such anatomic conditions exist, enucleation of the cervix can be done in less time than the manufacturing of the pedicle, the adjustment of the serre-nœud or elastic ligature. Furthermore, abdominal fixation of the pedicle can not be accomplished in all cases.

In conversation with several distinguished abdominal surgeons, including Dr. Bantock, of London, I find that these gentlemen meet with cases where no pedicle can be formed to fix in the abdominal wound. It is to this class of cases I would invite the best directed efforts on the part of those who have a heartfelt interest in this class of suffering women.

One's per cent. of recoveries would undoubtedly be much better if after making a careful examination which discloses a tumor deeply imbedded in the pelvis, we would discourage operative procedure; but in my first 100 hysterectomies I found a number of cases were gangrenous tumors and tumors containing gangrenous nodules, causing slow death in some cases and rapid death in others from septicemia. Within the last six months I have operated on seven women who had either gangrenous fibroid tumors or tumors with gangrenous nodules. In five of the cases the nodular masses were deeply imbedded in the pelvis, and two of the cases were operated on within one week. In each case a nodule as large as a cocoa-nut was completely imbedded in the broad ligaments, having been developed from low down on the side of the uterus, and in both cases the nodular masses were in a state of gangrene, they having caused temperature ranging from 100 to 103. In two other cases the subserous tumors had become gangrenous from small twisted pedicles. In each case rapid and well pronounced septicemia threatened the life of the patient. Surely the technique of suprapubic hysterectomy is not complete until guided by sound surgical principles. We have *methods* and *means suitable for such emergencies*. In this class of cases I have been pleased with the rapidity with which we can ligate the upper portion of the broad ligaments, cut the same loose from the tumor, peeling the peritoneal covering off from the tissue leaving a little subserous tissue beneath it; enucleating nodular masses, and directly find ourselves down close to the external os with only an occasional bleeding from some enlarged arterial twig.

The most serious question in my mind in these cases is how to properly drain the cavities from which these nodular masses have been enucleated. In a recent case I packed the cavity in the broad ligament from which I had enucleated a gangrenous mass as large as a cocoa-nut, with iodoform gauze, bringing the same out at the side of the pedicle which I had fixed in the abdominal wound. In addition to the gauze I placed a metallic drainage tube well down into the pocket. I wished to be absolutely certain that this cavity was thoroughly drained, believing that in other cases where I had trusted to gauze alone for drainage that it was not satisfactory. In the first forty-eight hours we pumped out of this drainage tube fully a pint of black blood, which coming from the cavity occupied by this gangrenous nodule gave a considerable odor, notwithstanding the thorough washing of the cavity through the drainage tube. I believe it would be better in such cases to secure the most thorough vaginal drainage—not only through the opening made by the enucleation of the uterine cervix, the same being packed with gauze surrounding the drainage tube, but by making a free and direct opening from the bottom of the cavity in the broad ligaments into the vagina. It has been taught that the dangers of removing cysts or fibroids from the broad ligaments lies in the disturbance of important plexuses of the nerves. My observation leads me to believe that the shock is not materially great in such enucleation, and that the bad results following such operations are due to the use of drainage which does not properly drain. But while I secured the most perfect drainage in the case referred to by bringing the drainage tube up to the side of the pedicle, I would not advise abdominal fixation of a pedicle in cases where nodular masses are enucleated from the broad ligaments and even imbedded in the region of the cervix where we would form a pedicle, believing that these cases can be more successfully treated by removal of the entire cervix with free vaginal drainage.

As I suggested at the beginning of this paper, one of the great objections to total extirpation of the cervix and vaginal drainage is that we make an additional wound and have a possibility of vaginal infection.

I concede further that it is not always possible to render the vagina surgically aseptic. I have had a number of cases where I used the most thorough antiseptic douches, and then sought to wash out the cavity of the uterus for the purpose of packing the same with iodoform gauze and also to close the external os by firm suture, and found the cervix and external os so retracted into one of the cul-de-sacs or behind the pubes, that it was impossible to reach it with any form of speculum in such a manner as to enable me to pack the cervical cavity or stitch the same so but that during our handling of the tumor we found a large quantity of bloody purulent discharge in the vagina which had escaped from the external os. In a large per cent. of cases a thorough washing of the uterine cavity, packing the same with iodoform gauze and then stitching the external os will prevent this purulent fluid from escaping into the vagina during our handling of the tumor. Then thoroughly washing and even scrubbing the vagina with a brush and packing the same, including all its cul de-sacs, with iodoform gauze, will give us a reasonable assurance that this tube has been made aseptic and reduces the dangers of infecting the peritoneal cavity to the minimum.

In a conversation with Dr. Bantock, of London, I expressed the hope that in the near future we would be able to remove fibroid tumors with the same low rate of mortality which follows our work in removing ovarian cysts. The good Doctor replied: "This can never be done for the reason that the anatomic conditions are essentially different." Carefully reflecting over this statement I have become thoroughly convinced that a more thorough study of the essential anatomic conditions which exist in an abdomen containing a fibroid tumor, as compared with one containing an ovarian cyst, would enable us to bring the mortality of the two operations to something approximating equality.

I have a number of times left the greater portion of the uterine arteries to remain in the pelvis of

the patient, but from the results I had, I was thinking that the possibility of infection through the rich chain of lymphatics at the side of the uterus was greater in such cases than where broad ligaments were thoroughly constricted by ligature all the way down to the opening in the vagina. This led me to express, in the Chicago lecture heretofore referred to, my preference for cutting around the cervix rather than enucleating it. But carefully reflecting over the statement of Dr. Bantock that the anatomic conditions were essentially different in fibroid tumors from what they are in ovarian cysts, I became convinced that we often blame the technique which we have used in treating the pedicle when the cause of death ought to be explained in some other way. For example, when the parietes of the abdomen are rendered thin by the pressure of an ovarian cyst, the blood supply is reduced so that all the intra-abdominal viscera are more or less anemic. This condition is in marked contrast with the hypernutrition often present in and about the pelvis which contains a fibroid tumor. I am quite sure that deaths occur in consequence of our almost losing our heads in the determination to make the pedicle and all pertaining thereunto as perfect as possible and neglecting perfect approximation of the abdominal incision, always as large as the tumor, including its peritoneum. I have many times cut through two inches of fat to reach a fibroid tumor, and unless such a wound be thoroughly closed by three rows of sutures, the internal one being of fine or cuyron tendon, with stitches not more than one-fourth of an inch apart, and then making absolute sero-serous approximation, there is danger of infecting the peritoneal cavity by the wound leaking into the abdomen. Too often we take extreme precautions to nicely adjust the outer integument, when it would be better if any leakage from the wound is to occur that it shall pour outward and not inward. Again, the more vascular condition of the peritoneal cavity and its contained viscera in cases of fibroid tumors, as compared with ovarian cysts, warn us of the greater intolerance of rough manipulations, making it necessary to protect intestines and viscera as much as possible during operation by hot sterilized towels and sponges, by temporarily bringing the wound together over the intestines with a temporary stitch or volsella, and *above all, and over all, by the most thorough irrigation* of the peritoneal cavity with water at a temperature of not less than 110, not only after the work has been completed, but at intervals during the work, so as to undo the harm we do to the vasomotor nerves distributed to the pelvic and abdominal viscera. Half a dozen pitchers full of water are none too many and if we have produced material shock as evidenced by the pulse, a few pitchers of water poured through the drainage tube and allowed to pour out again has at times, as I believe (permit me to say I absolutely know), saved lives that otherwise would have been lost. The operator of to-day who seeks to do away with the "wash out" and the drainage tube on all occasions on theoretical grounds, is rolling the wheels of progress backward. The skilful management of a patient during shock is of very great importance indeed. The use of opium to put the disturbed tissues at rest has the genuine ring of surgical wisdom. The use of strychnia to keep up the tone of the nerves distributed to the intestinal tract and thereby counteract the tendency to gaseous distension of the bowels, is one of the precious comforts to the anxious abdominal surgeon when his patient is low in shock.

When Ephraim McDowell made his first ovariotomy, the citizens surrounded his house threatening his life because he was about to "butcher a woman." The sheriff of the county interfered. At first they refused to listen to his pleadings for the Doctor's life. Finally he struck a compromise, the mob agreeing to let him alone if the woman recovered, the sheriff agreeing not to interfere if the woman died. This was a crucial test of the Doctor's heroism. Other heroic surgeons did not hesitate to remove ovarian cysts, but allowed women to pass on to their graves if the diagnosis convinced them that it was a fibroid tumor. Still later, surgeons removed fibroid tumors if they were pear-shaped and a pedicle could easily be formed, allowing women to pass to their graves if the examination showed the tumor to be deeply imbedded in the pelvis by nodular masses. Even the great and noble Dr. Thomas Keith, after battling with fibroid tumors with as good a per cent. of recoveries as any one at that date, finally abandoned fibromectomy, resorting to the use of electricity and only wished he had back from their graves the patients who had died from his operations for fibroids. Thank God there were others to take up the work when he became discouraged.

The old adage that the qualifications of a surgeon were "the head of an Apollo, the eye of an eagle, the heart of a lion and the hand of a woman," is eminently true, especially as regards him who would seek to be successful in removing fibroid tumors. The head to plan and to meet the surprises which spring on us during such work; an eye to see quickly the exact constriction of every ligature and adjustment of every suture; the lion heart to forge forward in this aggressive work when our per cent. of recoveries might be better if we would let fibroid tumors alone, especially bad ones; the nimble wit in the ends of the fingers, backed by an indomitable will to skilfully and speedily perfect the adjustment of the last suture with the same precision as the first, make a combination of qualifications suggesting that the surgical type of a man is not to be found thirteen times in a dozen.

No operation so thoroughly demands that the trinity of surgery be carried out—thorough preparation of the patient, thorough operation and skilful after treatment.

As American surgeons we have a right to be proud that no other nation leads us in the originality of methods or successful results in removing fibroid tumors. Almost every State of our Union has operators who would venture to give a woman with a fibroid tumor the chances of life which surgery offers.

With a more thorough and perfect understanding of the essential anatomic conditions which make an abdomen containing a fibroid tumor different from one containing an ovarian cyst, with the realization of the ideal method applicable alike to all fibroid tumors regardless of their morphology—a method as successful in the hands of the many as the few skilled operators, may we not hope to say with all sincerity that fibroid tumors can be removed with the same low rate of mortality which has placed ovariotomy among the brilliant triumphs of the century. Then shall the torch lighted by McDowell in the midnight darkness shine forth with resplendent

glory in this brilliant noonday of abdominal surgery. The century which in a few years will have rolled on to the eternal past, has placed in the magnificent temple of medicine many pillars of surpassing beauty and grandeur, while its surgical columns have risen high toward Heaven where as gilded towers, they fain would vie with the God-given sunshine in dispelling the chill and gloom of human agony.

Chirurgia's tower, thy lights resplendent blaze
Dries woman's tears, and lengthens out her days;
McDowell and Sims of our Columbia's clime
Began the work moved onward nigh sublime.
To women, then, these blessings shall be given—
Queen of the home and home the type of Heaven.

Abdominal surgery is *proud* of her past because it is prophetic of her *future*. Even now in the vital present it shall stand forth unchallenged as the crowning glory of all science and of all art.

SECTION ON OBSTETRICS AND DISEASES OF WOMEN.

TUESDAY AFTERNOON—JUNE 5.

This department of the AMERICAN MEDICAL ASSOCIATION met in Covenant Hall, Odd Fellows Building, San Francisco, on Tuesday at 2 P.M. June 5, 1894. DR. JOSEPH EASTMAN, of Indianapolis, presided, and delivered the opening address and read a paper on "Removal of Fibroid Tumors."

It was moved and seconded that the paper read by Dr. Eastman be received for publication. Carried.

The regular Secretary being absent, DR. EASTMAN appointed DR. H. P. NEWMAN, of Chicago, to fill the position during this Convention.

DR. F. H. MARTIN, of Chicago, then read a paper on the "Treatment of Fibroid Tumors of the Uterus," followed by DR. E. E. MONTGOMERY, of Philadelphia, with a paper on "Removal of Fibroid Tumors through the Abdomen."

A discussion of the three papers was then taken up. A motion was made, seconded, and carried, that DR. R. E. HORTON, formerly a surgeon of Indianapolis, should open the discussion.

DISCUSSION.

DR. HORTON—This is unexpected that I should be called upon in this way to discuss this question, and I may be excused, probably, if I only make a few remarks on the occasion.

I have in my past life pursued this line of thought and practice. I have operated a number of times on this class of trouble. While it is true that we have three methods presented to us for the purpose of dealing with fibrous tumors, it is also true that medical men are not yet agreed as to the methods which shall be selected. I am one of those who do not believe that we can bring this question of operative method to a single method alone.

I have had a little remarkable experience on some lines. I have one case in my mind which would be difficult for these gentlemen to decide on any one of the three lines suggested here to-day. I recognize the fact that this question is a difficult one, but it has been opened up very much by our methods in ovarian procedure, by the removal of ovarian tumors, etc.

I occasionally came across this class of trouble, of fibrous tumors, and I found difficulties, as they have already related—difficulties in my own mind as to the proper course to be pursued. As the chairman has remarked, a man needs a clear thought and a steady hand, and a determination to win on the side of the patient, or else he certainly would not succeed with the class of tumors we are considering. The method of enucleation is one of those customs which is open to discussion. The abdominal method is one which has been pursued both for tumors that were not fibroid and ovarian as well.

Now the question comes back to us, What method shall we pursue, the abdominal or the vaginal? It can only be determined, as I apprehend, by the relative conditions of the case after having made a clear and careful examination. I have found it so in my own experience at any rate. I have had to decide these cases for myself when there was nobody to help. In these last few years I have been out on the western plains of Texas seeking health, and still continuing my work, and I have found it necessary to decide these questions entirely by myself, as I had nobody to go to and no one to call to my aid. These questions have come before me as they are presented here to-day.

I want to say in reference to ligation of these vessels, it is a question that years ago I determined in my own mind would be a successful method of controlling hemorrhages, not only in matters connected with tumors, but in other matters of hemorrhage. I am satisfied that we have come close to the time, if not already presented to us, when uterine hemorrhage can be controlled by ligating these vessels. You have all heard in a paper that has been read that the broad ligaments may be tied in such a way that it adds but little to the danger of the patient in hand. That is an effect which I have worked for in my own experience. I will very briefly allude to a case in which I think these gentlemen would neither enucleate or ligate the vessel. They would be forced, as I believe, to resort to the abdominal method in preference to any other method in the removal of the tumor.

I was called to a case of fibroid tumor where there was a mass of forty-five pounds in weight to be removed. It was growing out around the neck of the uterus. It was a question whether to remove it, as the patient had already been reduced to an extreme degree, or to let her die by letting it remain. I decided to operate upon it. She was advised as to the possibility of her death even upon the operating table, and also that she might recover. An abdominal operation was performed. The uterus was entirely imbedded in this mass of fibrous tumor. It had grown out from the base of the uterus and around its neck in such a way that the pelvis and the abdomen was entirely filled up with this growth. I decided that it could not be removed by an incision of the vagina and that the only method was the abdominal method, also that this was the only possible chance for the patient. I decided that we would have to ligate these vessels, as has been suggested here—ligate in such a way as to avoid the possibility of hemorrhage in the abdominal cavity. That operation was successfully made—successful so far as the operation was concerned, but not saving the patient's life. I am not ashamed to say that I made a failure.

ORIGINAL ARTICLES.

REMOVAL OF UTERINE TUMORS THROUGH THE ABDOMEN.

Read in the Section on Obstetrics and Diseases of Women at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5-8, 1894.

BY E. E. MONTGOMERY, M.D.

PROFESSOR CLINICAL GYNECOLOGY JEFFERSON MEDICAL COLLEGE; OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL; GYNECOLOGIST TO JEFFERSON AND ST. JOSEPH'S HOSPITALS AND CONSULTING SURGEON TO LYING-IN CHARITY HOSPITAL, PHILADELPHIA, PA.

The earliest abdominal operations for uterine growths were undoubtedly not deliberately premeditated but were errors in diagnosis. The abdomen had been opened for removal of an ovarian tumor. Between 1825 and 1851 fourteen such operations were reported, of which five had a fatal termination. Some surgeons then became bolder and ventured to extirpate subserous pediculated tumors. Granville had an unsuccessful, and Atlee and Lee successful cases.

Burnham in 1853 was the first American surgeon to undertake a partial extirpation of the uterus, while Kimball first practiced hysterectomy for an interstitial fibroma the cause of violent hemorrhages, and his patient recovered.

Partial extirpation of the uterus, in which the cervix uteri was used as a pedicle, early developed two methods of treating the stump,—the intra- and the extra-peritoneal.

The ligation and return of the stump to the abdominal cavity would seem the natural and more desirable procedure, but the elastic character of cervical tissue would permit the stump to shrivel so that its vessels were no longer compressed, and violent often fatal hemorrhage would follow the closure of the abdomen. The stump could not be secured *en masse* with sufficient firmness to insure against its occurrence. Koeberle made a great advance over ligature *en masse* when he suggested the metallic loop. Péan in 1870 reported a successful case and later published a work in which he presented such precise rules for the various details of the operation as to permanently associate his name with the extraperitoneal treatment of the stump. The operation consists in making an incision sufficiently large to permit the mass to be raised up and brought out. Where the cervix is long and readily affords a pedicle, fixation pins may be introduced beneath which the wire of the serre-nœud is applied. If the pedicle is short it will be necessary first, to ligate and cut through the broad ligaments. The pedicle is placed in the lower arch of the wound and its peritoneal covering which has been stripped back stitched fast to the parietal peritoneum,—unless the two surfaces can be held in apposition by the serre-nœud. The wound is closed and the stump so treated as to produce desiccation and separation of the strangulated portion without suppuration. The rubber ligature may be substituted for the metallic wire.

The great advantage of the extraperitoneal method is that the stump is under observation and the occurrence of hemorrhage immediately recognized and readily arrested. It has a number of disadvantages.

1. The tumor may have so distended and involved the cervix as to render the establishment of a pedicle sufficiently long to be treated externally very difficult, and the resulting traction may be so great as to cause severe pain and extensive ulceration from the pressure of the pins.

2. It is difficult to keep the external devitalized portion of the stump aseptic and prevent suppuration.

3. With separation of the external portion there is retraction of the stump leaving an excavation to fill up by granulation, thus prolonging convalescence.

4. With a large stump and its subsequent retraction there must necessarily result a weakened ventrum, greatly increasing the danger of subsequent hernia.

Kleeberg, of Odessa, in 1876 suggested the use of the elastic ligature to control hemorrhage and favor the intra-abdominal treatment of the stump. It is certainly efficient in the first object but the strangulated stump does not always obtain sufficient nourishment to prevent it sloughing, and thus become a source of danger from infection. A similar danger occasionally attends the formation of flaps which are subsequently sutured with deep buried and superficial catgut sutures as suggested by Martin.

In one case the writer had the entire surface of the stump slough. Fortunately he had used gauze drainage which afforded an escape for the mass and thus saved the life of the patient.

The greater familiarity of detail secured through frequent operations, and the desire to avoid the disadvantages of the extraperitoneal method, have led to a marked revision of the former methods of operating, in which the entire uterus is removed, or only a small portion of the cervix is retained. As a preliminary to the operation the vagina should be thoroughly cleansed by scrubbing with a 2 per cent. solution of creolin which contains tr. sapon. virides ʒi to the pint. The solution should be removed by washing with sterilized water. The mucus should be curetted from the cervix and the canal be packed with gauze. The vagina should be tightly packed with gauze for the double purpose of raising the uterus and rendering plain when the vagina is reached. This procedure enables the operator to more readily secure the uterine arteries and displaces the ureters from the field of operation.

When the tumor is small it is better to place the patient in the Trendelenburg posture, as the deeper pelvis can thus be better inspected. After raising the tumor upon the abdomen, the peritoneum should be incised and pushed down, forming anterior and posterior flaps, the uterine arteries ligated and finally the ovarian. The broad ligaments cut and the posterior wall of the vagina opened. The removal of the tumor including the entire uterus is now easy. The tissues are cut with scissors hugging closely the cervix. The pelvis should be carefully sponged, any bleeding vaginal vessels secured and the peritoneal flaps united with fine silk or animal continuous suture. The closure of the peritoneal wound excludes from the abdominal cavity all the ligatures. The gauze should now be withdrawn from the vagina and a gauze drain be loosely placed between the raw surfaces to insure drainage.

The alternate operation to this, denominated the Eastman, Goffe or Baer operation consists in securing in a similar manner the ovarian and uterine arteries and cutting through the cervix, leaving that portion which is inclosed by the upper part of the vagina.

The cervical canal may be sterilized by cauterizing it with the thermo-cautery by carbolic acid, or it may be left alone. Some stretch the canal and pass through it a piece of gauze which serves to drain the cavity beneath the peritoneum; while others avoid any drain. The peritoneal flaps may be apposed by continuous suture or be held in apposition by one or two central sutures. Either of these operations indicate a marked advance in peritoneal surgery, as they afford an escape from the disadvantages of the extraperitoneal treatment of the stump.

Of the two procedures, the entire removal of the uterus seems, to the writer. the preferable procedure. The retention of the stump does not afford any especial facility in the operation, it is of no especial subsequent advantage to the patient and when large, through the decreased nutrition after ligation of the uterine arteries, it may be a source of sepsis.

ENUCLEATION.

All the methods for the removal of fibroids we have thus far discussed involve the sacrifice of the uterus. In subperitoneal pedunculated growths where the uterus was otherwise free, the sacrifice of

the organ would certainly be unjustifiable and myomectomy would be the proper procedure. There are growths, however, which involve the wall of the uterus, in which the tumor may be enucleated and the genital functions remain undisturbed. The operation consists in opening the capsule of the tumor and displacing the growth from its bed, then after trimming away shreds and drying cavity, introduce sutures so as to completely close the cavity. The peritoneum should be closed over the deeper sutures.

DISCUSSION.

Dr. Lapthorn Smith, Montreal—I have nothing to say but words of highest praise for the excellent papers we have listened to with so much appreciation. I think Dr. Montgomery has presented very fairly the present ideas he holds with regard to the treatment of fibroid tumors by the various methods which are now in use. But I think we may say a few words more about a few points which have not been touched upon. I think that I express the feelings of nearly every practitioner who has to deal with these cases, that were it not for the inevitable death rate, we would all be in favor of the total extirpation of the uterus. But that terrible point of death rate is the one shadow that is overhanging us all the time, and the only thing that is following me all the time when I am deciding how to treat a woman who puts her case in my hands, suffering from a fibroid tumor. That is why I risk being called slow sometimes—when I treat that woman with electricity for two or three months before I decide to have an operation. But I am glad to say, and it is my duty to say it here, that I have a great many women, perhaps thirty or forty, who have within a few months or half a year been restored and are enjoying good health, are free from pain and hemorrhage, and were treated only by galvanism and general constitutional remedies. But, unfortunately, electricity does not cure all cases. Now and then a case we treat for two or three months with electricity is not cured. Then we must do something more. In deciding what to do next I think I must still keep that death rate in view, and if I can cure the hemorrhage by an operation which has no death rate, or almost no death rate, that is the one I would give her the choice of next. It is for that reason I admire so much the operation of Dr. Martin, of Chicago, and why I think his paper has been so valuable to all of us. That is an operation, it seems to me, almost free from danger, and one we should be in favor of before we resort to one, which in the very best of hands has a death rate of 5 per cent. We can not expect that many can attain the splendid results which Dr. Eastman has. It is only after a long time and with unusual experience and unusual ability that a man can remove large tumors by this method with so small a death rate. In a few years, perhaps, when the operation has been so perfected that many more of us can hope to attain his results, we may say that is the operation to choose next. I wish to be understood, however, that I have nothing but words of admiration for the operation that Dr. Eastman performs. I am speaking for the majority of practitioners, even for the majority of specialists, and I say we should give the women the benefit of Dr. Martin's operation before we subject them to an operation which, in the best of hands, will give a death rate of 5 per cent., and in the hands of those less skilled a death rate as high as 10 or 15 per cent.

I wish to answer the question as to whether I punctured the tumor when using electricity. I wish to say distinctly that I do not, for the reason that I believe it would introduce an element of danger.

I also wish to answer another question that has been asked, and which is a question of great interest: Does electricity ever cause degeneration of a tumor which had not been degenerated before? At one time I thought it did so, but on studying two or three cases subsequently I found the fault was not in electricity, but in the one who diagnosed the cases. A patient was sent to me whom five experienced physicians decided had a fibroid tumor. I applied electricity for six weeks, and finding the patient no better I advised an operation, and found, not a fibroid of the uterus but a great big sarcoma of the ovary. The fault was not with electricity, but with the diagnosis.

I have also had two cases of sarcoma occurring in the uterus which I believed was fibroid. So it looks as if the fault is more in diagnosing than the application of electricity.

Dr. F. H. Martin—I have been very much pleased with the reception given to my part in the meeting this afternoon. I wish to eradicate one idea that may have been left on the minds of a few who are not acquainted with me, and that is in regard to this so-called conservative operation that I have brought forward. I think the key-note was struck by Dr. Lapthorn Smith when he stated that we should not be afraid of conservatism. If you have all got the idea that I never did any work except to play with electricity, or do some little minor operation in the cervix, you are very much mistaken. My operation is not one that applies to all cases, and I want it distinctly understood that I do as much abdominal surgery in Chicago as any one, and it is not a conservative operation that I have developed and adopted because my courage is not great enough to do abdominal surgery. This operation was developed for the purpose of avoiding the necessity of submitting a patient to that inevitable death rate of 5 per cent. I have been unable to get below that, and I know of very few that have. I believe that I have been able to get as low as any one. This hysterectomy is a thing that brings gray hairs to the abdominal surgeon. From the time we operate on these cases until they are "out of the woods," as we say, they are a constant worry to every abdominal surgeon.

I do not want you to think for a moment from the remarks that I have made that I would adopt this operation for every case of fibroid tumor—that I would do hysterectomy in every case where I could not do this operation. I want you to bear in mind that in the great Gynecologist Convention held in Washington in 1876 that I was one of the chief contributors and that I then reported a great many cases that I had operated on at that time. I have had the pleasure of being called an electric crank with my friend Dr. Lapthorn Smith, and others. I do not want you to forget that I believe in the use of electricity. The day before I left Chicago I operated upon a case sent to me by a physician. I did the operation, but I believe if I had the thing to do over again and had a little more time I should have used hysterectomy. I ligated the broad ligaments, and fortunately succeeded in ligating enough to include not only the uterine artery, but I think, all the branches.

I wish to add my testimony in regard to the effects of electricity in these fibroid tumors. I have never known malignant trouble to follow its use; and I have never known malignant degeneration to follow this process I have described to-day. Although it is only two years old, I can speak from a good deal of experience on that point. I have had malignant cases, so-called, referred to me, and one case in particular was referred to me by one of the best diagnosticians in this country as having a tumor as malignant as sarcoma. He said: "If you can cure the hemorrhage by electricity I believe you can cure the case." I treated the case, and succeeded in checking the hemorrhage and reducing the tumor, and as he expressed it, cured the patient. I said: "Doctor, you made a mistake in your diagnosis." He said: "I don't believe it."

Now in the discussion of hysterectomy there has been one method that has been somewhat slighted; I don't believe in slighting any one, and especially if that one happens to be from Chicago. In my article I stated that in the operation of abdominal hysterectomy, if I could take my choice it would be this way: Payne last, Byford first, and Eastman next. The reason I prefer Byford is because we leave that key to the arch that has been spoken of in the vault of the vagina and cervix. The operation is performed down through that point exactly as Baer's operation is performed; the broad ligatures are ligated, and the tumor is cut off above the cervix; the cervix is cored and sewed up, the perineum is sewed over that, and then a small opening is made anterior to the cervix in the vault of the vagina, and the cervix is introverted into the vagina. If we have not succeeded in tying the uterine artery thoroughly, as we sometimes fail to do, you have the hemorrhage where it can be controlled. This makes, to my mind, an ideal method; your stump is outside and at the same time you have all the spring and give; there is no pressure on the bladder, no drawing of the abdominal wall; there is no absolute fixation, and you have preserved the key of the arch.

I will now take up the point made by Dr. MacMonegle as to the advisability of allowing a woman to become pregnant following an operation, as to the advisability of ligating so much of these tumors, and as to whether degeneration would not occur—that is, so much of the nutriment would be shut off that gangrene will occur.

In the first case I operated on I ligated one side, and after ligating thoroughly I noticed that the cervix changed color and the woman was flowing badly at the time. The hemorrhage ceased and I started in to ligate the opposite side and did a very poor job—that is, I was really afraid to ligate the opposite side of that broad ligament for fear I would get gangrene. That case is not one of my star cases. It has not done as well as I would have liked, although the woman is very much improved in health. I believe I made a mistake in not ligating thoroughly. We must remember this: We wish to cut off the enormous blood supply and starve the tumor; we must understand that the tumor in order to have growth must of necessity draw upon the blood supply. After I had ligated the broad ligaments enough to include both ovarian arteries, while I cut off two-thirds of the blood to the tumor, there was probably more blood going to that tumor than would go to a normal uterus. And for that reason I believe we can safely cut off three arteries —two on one side, and one on the opposite—and there will be blood enough to supply a normal pregnancy. I am sure that in a very few years I will be able to settle that point definitely. I believe that two or three of these cases I have operated upon for genuine fibroid will be put into a condition so that pregnancy will occur.

Now in regard to the preparation of the patient: It is impossible to make the vagina clean without cleaning out the uterus. The first thing is to bring it down, dilate it and thoroughly clean it. I would not have an aseptic stump in the operation. I would pack it with gauze and allow it to remain long enough so that my side incision healed before the gauze was removed. I have had, as you noticed, suppuration in one case. An abdominal wound, even where everything is favorable, occasionally suppurates—at least in my experience.

I wish to thank the ASSOCIATION for their kind attention.

(A motion was made by Dr. F. H. Martin that the Chairman close the discussion, which motion was seconded and carried.)

DR. EASTMAN—Patients and tumors talk more eloquently than doctors. Some of you will remember that the main argument which I advanced in connection with the method which I have just described, was a method applicable to all cases, regardless of the form of tumor. I am well convinced that Dr. Martin's method is a very good one. I, at his suggestion, used it in one case. But if a man is going to be an abdominal surgeon he must have a good deal to do with the women, and if he does not please the women he will soon have no business. The women in whom I have removed the ovaries and allowed the tumor to remain, and the women in whom I ligated the uterine arteries, the tumor still remaining, are very unhappy; they are following me by faith and not by sight. They may obtain sight later on, but thus far they say: "I wish that tumor was gone; it haunts me the last thing when I go to sleep and the first thing when I wake up in the morning."

But I can conceive of cases where the operation is advisable and, as I say, I used it in one case. I think the woman following me by faith a little further, can see I did a wise thing in not removing the tumor. But it is necessary for us to seek the truth and to get at the actual facts in the advocacy of any particular method. As my friend suggested, set out the peculiarities of a given case and apply our remedy.

Now I wish to ask Dr. Martin how he could tell the gangrenous mass existed in the tumor. I have dealt with some five or six cases this year where I had gangrenous nodular masses in the tumor. If I had ligated the arteries in those cases I surely would only have contributed to the death of the patient. The operation of ligature is applicable in some cases. But I would like to ask any one how it is we are going to determine in any given case that the tumor is gangrenous or not. This "grip" that has been going around has seemed to spend its force in the point of least resistance, in the tumor, and gangrene has been the result in a number of cases.

I will call your attention to this tumor before us. Right here is the cervical canal. Now I want to ask the gentlemen who fix the pedicle in the abdominal wound what they would do in this case. Electricity will not do, ligating will not do, for here is a gangrenous mass. Dr. Baer can not tie the uterine arteries, as he suggests, because here is a mass absolutely filling up both sides of the uterus. How are we going to get at the uterine arteries?

It is especially to this sort of case that I have directed my attention—and which is the subject of my paper—and I ligate the artery at this point here (showing), and I see no necessity for ligating the same artery again. As has been proven in the specimens here, we can peel back and go between the arteries of the uterus and enucleate the mass.

I had another case where I thought of ligating the arteries as suggested by Dr. Martin, but the tumor was imbedded in the pelvis to such an extent that it was very difficult to reach them; the pelvic roof was drawn up, and I could not reach them in that case. Those are simple cases where it is not available. So that all methods are not applicable. If there is any method available in all cases it is the one I have been describing. The point I make is, that where there is a good cervix, where it is not disorganized, that this can be enucleated in less time than you can adjust the ligatures and perform the other operations. This enucleation method will bear you out when the other methods are absolutely ruled out and can not be considered in that class of tumors.

It was suggested by some gentleman in the discussion that a little piece of gauze be put through the cervix for drainage. I most emphatically protest against this. If there is a drainage down into the vagina it must be thorough, so there can be a thorough washing out. If you are going to drain into the vagina, cut wide enough so you can pack in plenty of gauze. I prefer a rubber drainage tube. A drainage which is not perfect is absolute worthless and decidedly dangerous.

I want to be fair with the advocates of all these methods. It has been said: "Why fix the pedicle in the abdominal wound?" As I said in my paper, you have practically but one wound, whereas in all these other methods of total extirpation you have two wounds.

I have not, for reasons, referred to any gentleman across the water so far as dealing with fibrous tumors are concerned; we need go no further than Boston, for we are as advanced in methods and have as much success as in any part of the world.

It seems to me that nothing could make me happier than such perfection of methods (I put that in the plural) as will make the mortality so low that women will not dread the operation, and that we can point them to patients here and there who have been entirely relieved of fibroid tumors. This century of surgical triumph will surely accomplish all this. We are in the right line in discussing all these methods, weighing every method for what it is worth. There are those who are dying little by little; they are living in death; they are dying in life. They have repeatedly said to me that their life was not worth living, and they would be willing to be launched into eternity from the operating table rather than to feel that tumor there.

I refer in my paper to some seven cases in as many months where the patients were dying of tumors which were gangrenous. One lady came from Chicago with a fibroid tumor which she had carried for fifteen years. It seemed as if the patient was dying from internal hemorrhage. She was brought to me on a stretcher. I opened the abdomen and found several quarts of bloody serum. I succeeded in removing it. That case is a warning to all women who have fibroid tumors.

So I most emphatically say the statement that there is such a heavy mortality following hysterectomy must be put beside the statement that fibroid tumors are dangerous, and we can never know when they are harmless; when dangerous I think the fibroid tumor had better come out, and if there are nodular masses low down, take it out by the roots.

A CASE OF GANGRENOUS NECROSIS OF THE MAMMARY GLAND.

Read in the Section on Obstetrics and Diseases of Women, at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5–8, 1894.

BY J. SCHNECK, M.D.

MT. CARMEL, ILL.

On Dec. 3, 1891, I visited Mrs. C., who lives three miles in the country. She is a large, healthy woman with a good family history as to health, morals and cleanliness; has always lived on a farm. The house in which she lives is a large, new frame building, situated in a healthy location. She was then, at the age of 39 years, nursing her second child, which was healthy and in its seventeenth month. The mammæ were of medium size, and had never given her any trouble previous to this attack. The family had not been using rye bread or buckwheat cakes.

I found a deep gangrenous ulcer on the left breast, extending from near the nipple toward the median line; irregular in outline and about three inches in diameter. The margin of the ulcer was a black color, the bottom being covered by the characteristic ashy-gray coat. The healthy skin along the margin of the ulcer was overhanging the undermining soft parts. The whole gland was swollen, imparting a soft, baggy sensation to the touch. The border of the ulcer was a deep red color which gradually faded off into the natural tint. The odor was very offensive and was that which is characteristic of dead tissue. She stated that about ten days previous to my visit she first felt a hard, tender lump at this point in the breast, and feared it would prove to be a small abscess, although the skin was not red over the hard part. She could not remember a time when the gland had been injured or bruised. As the hard nodule developed, the skin immediately over it changed to a black color, the discoloration gradually spreading from its center.

She had poulticed the breast for several days before I saw it. I ordered that the child be weaned; removed all the dead tissue I could with forceps and scissors; gave full doses of muriated tincture of iron and quinin, and directed her to have concentrated animal diet. The breast was to be washed clean with bichlorid of mercury solution every two hours, then to be covered with a charcoal and flaxseed meal poultice. At the end of forty-eight hours the progress of the disease had not been checked by this treatment, the gangrenous surface was larger than the palm of a hand. I now made daily applications of nitric acid, diluted one-half with water, to the margin and under the overhanging skin. Otherwise continued the former treatment. This checked the progress of the disease in three days; but it was necessary to apply the nitric acid to a few small points where the disease would begin to spread, for several days more. In due time the diseased surface became covered with healthy granulations and in six weeks was entirely covered with skin. Eighteen months later I attended her in her third accouchement. The breast was then smaller than natural and deformed by a large scar. Milk was secreted freely by this gland after the confinement. The child nursed from both glands for about twenty months and was then weaned.

I have searched quite extensively in medical literature but have been unable to find a parallel case. I find reports of cases in which the extremities, lungs and pleura, tongue, pancreas, penis, vulva and mouth were involved by idiopathic gangrene; and other instances where it has involved wounds and other injuries, but have found no instance in which a healthy mammary gland was involved.

The mammary glands are so well supplied with comparatively large blood vessels, derived from different parts of the arterial system, that it is surprising to find destructive processes taking place in their tissues without a special cause. They are supplied with blood: 1, by branches of the internal mammary artery direct; 2, by the long thoracic artery direct, and by anastomosis with the internal mammary; 3, by anastomosis of the superior thoracic with the internal mammary artery.

The blood is collected at the base of the nipple in the *circulus veinosus*, and thence conveyed to the axillary and internal mammary veins.

The causes of gangrene usually given are more or less vague, especially when the exact process by which the resulting death is produced is asked for. The causes assigned are: 1, arrest or interference with the nutrition of the part; 2, atheromatous condition of blood vessels; 3, obstruction in capillaries; 4, obstruction in arteries; 5, obstruction in veins; 6, diminution of cardiac power; 7, diminution of vasomotor energy; 8, old age; 9, severe bruises; 10, intense inflammation; 11, debility from disease, as cholera, typhus, typhoid, measles, diphtheria, erysipelas, scarlatina, exophthalmic goitre, dysentery, anemia, diabetes and cerebro-spinal fever, all of which are reported to have been connected as causes of gangrene; 12, in hospital gangrene, some specific infection is supposed to exist. None of these causes appear to be applicable to the case just reported.

I find that authors give various shades of meaning to the words, mortification, gangrene, necrosis and sphacelus.

"When a soft part is dying, it is said to be in a state of gangrene; and when dead, in that of sphacelus."—Bryant, "Practice of Surgery."

"Gangrene is the arrest of the function of organic life in a circumscribed portion of the soft parts of the body, leading to complete death of the same."—W. MacCormac, "Quain's Dictionary of Medicine."

"Gangrene is death of a part of the body from the gradual or sudden arrest of its nutrition. It is usu-

ally applied to the process of mortification in the soft structures. The analogous condition of bone is called *necrosis*. Animal tissues have two modes of dying—the one is *molecular*, or death by granular metamorphosis, in which no trace of the anatomic or histologic properties of the tissues remain; the other is death in *bulk*, in which, although the tissues deprived of life undergo rapid decomposition and ultimate disintegration, they retain for a time something of their original form. It is to denote this last variety of tissue death that the term, gangrene, is employed."—Wyeth, "Text-book on Surgery."

"The death of any part of the body is called necrosis. Necrosis of external parts of the body, attended by shrinkage and mummification of the tissues, is called dry gangrene. Necrosis accompanied by putrefaction of the dead tissues is called moist gangrene."—Flint, "Practice of Medicine."

"By the term, mortification, is meant the death of any portion of a living body. Gangrene may be said to imply a spreading destructive process, attended by progressive loss of vitality in the living tissues, of which sloughing phagedena, or hospital gangrene, affords a good example. When soft parts are dead, they are said to be in a state of sphacelus. A more limited dead portion of the body is a 'slough.' Death of bone is termed necrosis; a dead piece a sequestrum; the process by which a dead bone is separated from the living is called exfoliation. Some authors apply the term 'necrosis' to death of any tissue; others extend it from bone to death of cartilage only."—Holmes Coote, "Holmes' System of Surgery."

"Mortification may be defined as the death of a part, the rest of the organism retaining its vitality. The word, as usually employed in this and other countries, is synonymous with gangrene, so much in vogue among French writers. Formerly the term gangrene was used to denote that state of a part which immediately precedes its dissolution, while sphacelus was employed to signify the complete extinction of life, without any possibility of recovery. In speaking of the death of a bone, necrosis is the expression generally used. It would save much trouble, and prevent confusion, if all these terms, excepting the first, were abolished."—Gross, "System of Surgery."

"Necrosis, gangrene, mortification and sphacelus are terms used synonymously to indicate the death of a part. English and American writers have usually restricted the meaning of the word, necrosis, to death of bone, while the remaining terms were used to express the same condition affecting the soft tissues. Recently a sharp distinction has been made between necrosis and gangrene from an etiologic standpoint, according to which necrosis is said to have taken place when the circulation and nutritive changes in a part have completely ceased, to be followed by gangrene as soon as saprophytic bacteria invade it and give rise to putrefaction."—Senn, "Principles of Surgery."

Much of this confusion might be avoided if all would bear in mind the meaning of the words in their original languages.

Sphacelus is derived from a Greek word which means "I slay." Necrosis is derived from another Greek word which is translated, "I kill or make dead." Mortification is formed of two Latin words and means in the original, "I become dead." So that the three words are practically synonymous in their meaning and should be applied to a part that is dead, or in process of being destroyed, without reference to the nature of the tissue involved.

Gangrene is derived from the Greek language, and means "to gnaw" or "to eat," hence is applicable to rodent or phagedenic ulceration, which also results in destruction and death of the tissue involved. Clinically it can not be applied distinctively from the other three terms. I have used the word, gangrene, in its adjective form in the above title, for the reason that death of the tissues occurred by phagedenic processes.

THE PATHOLOGY OF TETANY.

Read in the Section on Practice of Medicine, at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5–8, 1894.

BY JOHN T. CARPENTER, A.M., M.D.
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1. By way of introduction, a brief sketch of the literature and history of tetany may not be inappropriate, since very few observations have been published or papers written in this country upon the disease in question.

The recognition of tetany (though Steinheim is credited by Stewart, of Montreal, as the first to give a true clinical description of tetany in 1830) dates from the memoirs of Dance, published in 1831 in the *Archives Générales de Médecine*, and entitled, "Observations on a Form of Intermittent Tetanus." The attention of the French physicians of this period having been directed to the new malady, various papers and memoirs were contributed by them from 1832 to 1855, elucidating its characteristic symptoms and conditions so thoroughly that it may be fairly conceded that to their labors is due all our present knowledge of this disorder. Several names were proposed to be given to this neurosis, some of them expressing the special pathologic view taken by the author, *e.g.*, rheumatic contraction occurring in nurses (Trousseau); intermittent tetanus (Dance); idiopathic muscular spasms (Delpech). Of other titles, conveying no necessary theory, that which has finally prevailed is "tetany," proposed by Dr. Lucien Corvisant in 1852. To this designation there can be no valid objection, and it happily calls attention to a marked feature in the symptomatology, viz: That there is, by reason of extension of the muscular contractions to the muscles of the jaws, a superficial resemblance to idiopathic tetanus.

Among other nations than the French the more recent contributions have been made by Buzzard, Gowers, and Horsley, of England; Berger, Erb, Eichhorst, Meinert, Mueller and others of Germany; Hun, J. Lewis Smith, Lyman, Carpenter, and Stewart of America.

Under the light thrown upon the course of tetany, its conditions, and its characteristics, by the various writings referred to, it has become well recognized as a neurosis, and been given a definite place among the nervous diseases.

2. Definition. Tetany is perhaps best defined as a nervous disorder, evidenced by tonic spasms of an intermittent character, which may involve any or all the groups of voluntary muscles from the extremities to the muscles of the jaws, and which may be reproduced at will, during a period of intermission, by compression of the nerve trunks or great vessels which supply the muscles which have been involved in the spasm.

3. Pathology. It will be noticed that this descriptive definition does not go beneath the surface. It does not attempt to deal with the underlying pathology of this disorder, which up to this time has not been definitely settled. Two reasons may be adduced for this pathologic ignorance, first: That in the few instances "where a histologic examination of the nervous structures has been obtained after death, no lesion to account for the symptoms present during life could be discovered."—(Stewart, Trans. of Assoc. of American Physicians, Vol. iv, 1889). Indeed, according to Lyman, the "later observers, particularly Berger, in the "German Enyclopedia of Medical Sciences," and Eichhorst, take the ground pretty strongly that there is no definite lesion connected with the disease." In other words, no information can be looked for from lesions found post-mortem, to instruct us in the pathology of tetany. It will be, later on in this paper, possible to give sufficient reasons why such a state of things might be expected to exist.

The second cause of pathologic uncertainty in the study of tetany lies in the various forms under which it has been observed to appear, and in the various conditions and circumstances which attend its approach and development. Four forms of tetany may be safely stated to be established by competent observations: 1, rheumatic or epidemic tetany—acute, usually not lasting over two or three weeks, rarely fatal; 2, a more chronic form, due either to chronic diarrhea, prolonged lactation, or other debilitating influences. Recovery is usual; 3, tetany occurring in the course of dilatation of the stomach—very often fatal; 4, surgical tetany, following the removal of the thyroid glands. This is frequently fatal.

But besides its different forms, tetany is attended and preceded by many and various phenomena which may well perplex attempts to reduce them to conformity to any common law. If diarrhea has been a common antecedent, cases are on record where constipation was the observed condition. Women in the puerperium and during lactation have been largely contributive to the lists of tetany—but so have children and men. Typhoid fever and phthisis have furnished a number of cases. So has exudative disease of the pharynx. What of surgical tetany, or of dilatation of the stomach as a cause? Can we make any generalization among all these varying conditions? Can any fundamental peculiarity be made to appear common to all these morbid states? This very difficult problem has seemed to me only solvable on the hypothesis of septic infection, and upon that hypothesis to be satisfactorily explained. Every antecedent disease that has been observed connected with tetany may be proved capable of inducing septic infection; or in other words:

Tetany, as a general rule, follows upon such diseased conditions of the system as are observed to produce morbid discharges from mucous surfaces, whose absorption is known to cause symptoms in remote parts of the body, due to the circulation of septic poison.

I will venture to speak more in detail of the antecedent diseases or morbid conditions most frequently connected with tetany. And first may be mentioned the puerperium or post-partum state. Trousseau speaks of it in connection with tetany, as an intermediate condition between health and disease. But it is more. It is very frequently a state of disease, due to septic inflammation of the generative tract. Modern obstetric physicians know that sepsis (mild or severe) is usual at this period. To it they justly attribute the so-called "milk fever," the puerperal inflammations, and many other of the diseases of puerperal women. If, then, a septic condition may and often does exist, sufficient to produce these diseases in the post-puerperal woman, it is not difficult to see that it will also account satisfactorily for the causation of tetany. This explanation will include necessarily the cases of tetany among wet-nurses in lying-in hospitals, where it was so frequently observed that one of the names bestowed upon the disorder was "rheumatic contractions occurring among nurses."

Next to the post-puerperal state may be mentioned diarrhea—and especially when chronic. It is almost unnecessary to more than advert to the conditions of putrefactive and septic intestinal catarrh as competent to produce systemic infection by absorption, and, consequently, any of the so-called septicemic results. Under my own observation, in the war of the Rebellion such results were very frequent, and septic poisoning from chronic diarrhea was fully recognized by all army surgeons of experience. Certainly, then, tetany may well have occurred after chronic diarrhea if it be a result of sepsis. Bearing immediately upon this point, I may note that Trousseau records "many cases in individuals who had suffered from cholera," and that some instances which were observed after the septic diarrhea of typhoid fever have been recorded by Demarquey and Delpech.

Tetany has been noted where the precedent condition was that of chronic constipation. Such a case case has been recently been published by Dr. J. Lewis Smith (*Med. News* Aug. 31, 1889). But we all know that in many instances constipation is attended by a catarrhal inflammation of some part of the intestinal mucous membrane, or even by putrefactive changes in the food, resulting in the production of poisonous alkaloids, which by absorption result in serious septic infection.

Certain cases of phthisis have been observed to precede the development of tetany. There is no difficulty here in the proposition that a sepsis which is competent to produce hectic fever is equally effective in causing conditions favorable to the development of the disorder which we are now considering.

In the recorded cases preceded by dilatation of the stomach, the putrefactive change in the gastric contents, the ptomaines generated and absorbed continuously for a long period of time, sufficiently explain the sepsis and the tetany as well.

To sum up, I will say that so far as my study of this subject has gone:

In all cases of recorded observations of morbid processes antecedent to tetany a probable sepsis may be inferred, and no other cause common to them has so far been discovered. It is therefore logically necessary to assign the causation of tetany to this fundamental peculiarity, as the antecedent factor, and to consider tetany not as an independent disease, but as a disorder consequent on some one of those diseases which generate septic poison.

5. I will adduce a few cases to illustrate the connection of septicemia with tetany:

Case 1.—Cecil D., age 13 months, was seen by me Sept. 29, 1883, for an apparently poisoned wound near the hip joint. An area of inflammation over a hardened base was found, apparently extending outward from a central puncture.

Pain and fever were noted. In a few days a small abscess was opened, and thin sero-pus escaped. Under antiseptic measures this healed readily enough, but nervous irritation persisted in spite of sedative treatment. Soon a tonic spasm affected the eyeballs, fixing them and directing them to the right. The left arm and hand were contracted typically, the flexed thumb and fingers inclosing it being fixed in the position of the so-called accoucheur's hand. No ordinary convulsions occurred, nor was there loss of consciousness. Some relief was obtained by the use of chloral. Later in the day, however, the eyes were again contracted by toxic spasm but were drawn in the opposite direction, to the left instead of the right, and now the right arm became involved. Some difficulty in administering remedies made me discover that the jaws could not well be opened. On the third day the condition of affairs was much worse. There was alternation of tonic spasm first upon the right side and then upon the left side of the body, in a curious manner, with completely locked jaws. I relaxed the contraction by chloroform inhalation sufficiently to allow the introduction of wedges of soft wood between the jaws; and to my great surprise the entire spasm relaxed. The pressure of these contracted muscles upon the wood seemed to exhaust their contractility. The eyes became straightened, and all muscles relaxed. Relief was, however, only temporary. The spasms returned. No treatment availed to stay the progress of the disease, and death ensued in about a week from exhaustion.

In this case the whole train of symptoms must be traced to the abscess. The child was previously in perfect health, and its surroundings unexceptionable. No local results were left. The abscess healed, but septic material had been absorbed, and tetany followed. There is absolutely no other explanation of the case possible.

Case 2.—Sophie S., aged 11 months, was seen Sept. 29, 1880, and underwent an attack of scarlatina. Septic poisoning was incurred from foul secretions in the throat. Purulent effusion into the right shoulder joint followed. I opened the joint freely, and evacuated a quantity of sero-pus. Under antiseptic management the wound healed kindly, and the joint was restored to usefulness, but nervous symptoms persisted. Restlessness, twitchings, and finally laryngeal spasm ensued. A fit of crying would bring on a paroxysm of "crowing croup" and fits of crying were not infrequent. The muscular contractions of tetany were then observed, and at first were mistaken for ordinary convulsions, but as the spasms were tonic and not clonic spasms it is very evident that their true significance was only recognized at a late date. The child eventually recovered, but for several years afterwards was liable to attacks of tetany (which I then recognized) from very slight causes, such as taking cold, or during attacks of ordinary diarrhea from subsequent teething.

Any comment upon this case which would ignore the principal part taken by the blood poisoning in the production of the tetany would be entirely illogical and unsatisfactory. If this case teaches anything, it is that tetany was here a nervous disorder consequent on previous disease, and that the sepsis, which caused purulent effusion into the shoulder joint produced also the tetany.

Case 3.—A little girl, 21 months old; recorded by Trousseau. Symptoms observed were edema of the feet and limbs, with the contractions of tetany very well marked. The child was of weak constitution, and was suffering from membranous, ulcerative stomatitis. The exudations which were of a grayish-white color extended over the tongue.

In this description we recognize a condition of vitiated and septic secretions, in which every opportunity exists for absorption into the blood of the material of the poison which I have assumed to be the efficient cause of tetany.

With these cases I will close the direct argument, and pass to other indirect and corroborative reasons why septic infection may produce tetany.

5. For, in a general way, it may be shown that many other nervous affections do directly follow sepsis, whence it is an easy deduction that tetany is not unlikely to be in the same category.

The following case, in which laryngismus stridulus occurred after a surgical procedure, which unfortunately ended in septic absorption, will be to the point:

Case 4.—E. A. C., aged about 6 months, was operated on for a very extensive erectile tumor of the scalp which was rapidly increasing. Hemorrhage being feared, ligation was done under chloroform. The strangulation was not perfectly accomplished, owing to the size of the tumor, and death of the parts proceeded slowly. Erysipelas was observed in the scalp about the ligatures, and the tumor was immediately removed by the knife, and wound dressed antiseptically. Infection, however, had already taken place. The left shoulder joint became widened, the superficial veins enlarged, and fluctuation was evident in the synovial sac.

I opened the joint, washed out its contents, and treated the wound antiseptically. A perfect cure resulted, with restored motion of the joint. But nervous disorder was left. Restlessness was extreme, and the child became the subject of severe laryngismus stridulus, which came on after the least distress or fright, or even after a crying spell. This, although, alleviated by every device and every attention possible, remained through life, the little sufferer dying eventually of malignant diphtheria.

The remarkable resemblance between this case and Case 2 will be noticed. Sepsis after scarlatina, and after a surgical operation, equally, produced purulent effusion into the shoulder joint. The final result of septic absorption was expended on the nervous system—in one instance tetany, in the other laryngismus stridulus resulted.

Case 5.—Leonard F., aged 28 years, sustained a fracture of the clavicle. From neglect and mismanagement secondary abscesses occurred under the axilla. I was called to see him for a violent attack of chorea, which set in after the evacuation of the pus from the axillary region. This chorea was attended with disturbance of the higher nerve centers, as shown by attacks of irrepressible rage, delusions, and other symptoms of acute mania. Entire recovery in about seven months took place.

I need not cite any other illustrations of the fact that serious nervous disorders may occasionally follow sepsis. It is sufficient for my purpose to direct attention to these ordinary medical facts, and show from analogy that it lends great weight to my theory of the pathology of tetany.

Why remote effects of septic absorption are expended on the nervous system is not very hard to understand. In the first place such a condition of blood poisoning produces a profound anemia. This was evident to army surgeons in cases of chronic diarrhea. It is equally observable in the septicemia of puerperal women. The absorption of ptomaines from the stomach and the intestinal canal equally impoverish the blood, and produce the anemia which is the proximate cause of nervous irritation. And, as pertinently remarked by Dr. Jacobi, anemia, particularly in infants and children, in whom the irritability is very great and the inhibitory centers very insufficiently developed, often predisposes to convulsions. To this I will add, and to other nervous disorders, including tetany.

Another observation which ought to be made here is as to the influence of habit in keeping up for a longer or shorter period the attacks of tetany. Given the septic absorption, and the consequent anemia, after nervous disorder (tetany for instance) has been induced, a condition of unstable equilibrium is set up in the nerve centers under which very slight influences will reproduce from habit, if from nothing else, the nervous symptoms which were at first inaugurated by septic absorption.

6. It may have occurred to many of us, since the investigation of tetany has been attempted, how rare a disorder it is. Forty or fifty years ago it challenged attention by its frequent occurrence in epidemics, among wet nurses in hospitals and others. Twenty years ago it was not commonly met with. Now, few of us can testify to having treated a case. What is there in the management of post-puerperal women which has hindered the development of tetany as a sequel? What is there in the diarrheas of the present day to produce a like immunity? Is it not because we recognize puerperal and intestinal sepsis, and make antiseptic medication our principal treatment, using douches of hydragyric bichlorid for the puerperium, and so modifying by resorcin, sulphocarbolate of zinc, creosote, or other antiseptics the intestinal secretions that a septic poisoning from diarrhea is now an exceptional result?

And so with all other diseases; so thoroughly have antiseptic measures been employed in treatment that septic poisoning promises to become almost a memory of the past. With the extinction of septicemia will come virtually the disappearance of septic disorders and sequelæ, and among them of tetany itself. Just as the puerperal inflammations have become less and less frequent under the rise and perfecting of antiseptic midwifery, so with tetany. It is even now a record mostly of past days in medicine.

And this to my mind is the most convincing proof of the pathologic considerations which I have had the honor to lay before you.

AUTO-INFECTION IN DISEASES OF THE NERVOUS SYSTEM AND SUGGESTIONS AS TO ITS TREATMENT.

Read in the Section on Practice of Medicine, at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5-8, 1894.

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The present is preëminently the time of the study of the etiology of disease, just as the past has been characterized by an almost exhaustive study of anatomy, physiology and pathology. In this connection the subject of infection has been the most profitable, as it has been the most interesting of all investigations; most interesting because little by little it has brought to light the knowledge of microörganisms that produce diseases, the causation of which was hitherto inexplicable; profitable because it has and will result in the discovery of the conditions that arrest their development and the agents that will neutralize their toxic influence.

Infection from without we may safely say produces the various forms of meningitis, including cerebro-spinal meningitis, tetanus, hydrophobia, acute poliomyelitis, acute ascending paralysis, the puerperal and syphilitic diseases of the nervous system.

The infections which arise from within are also important etiologic factors in developing diseases of the nervous system. The principal source of this auto-infection is the gastro-intestinal tract. The microörganisms there developed may produce simple indispositions or the graver conditions of delirium, coma, eclampsia, excessive elevation of temperature, acholia, cardiac failure and paralysis of the medulla oblongata. They bring about these results in several different ways. They may act mechanically by obstructing blood vessels of the lungs, kidneys and brain; they may develop anatomic lesions in epithelial cells, in muscular fibers and other elements, thereby producing edema, hemorrhage, suppuration and gangrene. They doubtless consume for their own nutrition that which is necessary for the nutrition of the individual, and they do produce toxines. We have long been familiar with the toxic agents produced by fermentation in the laboratory, such as carbonic acid, marsh gas, hydrogen, ammonia and such complex alkaloids as indol-phenal and skatol, and as toxic agents may be produced in the laboratory of the chemist, so may they be in the laboratory of this great tract.

The reality of this intestinal auto-intoxication can be shown by demonstrating the toxines in feces and in the urine which owe their presence therein to putrid fermentation in the intestines, and diminish *pari passu*, with diminution of the intestinal fermentation, and by the prompt appearance of grave symptoms when the progress of the fecal material is arrested; as, for example, in strangulated hernia.

These toxines are formed at all times in the ordinary gastro-intestinal tract, and the individual is saved from intoxication, first by the liver that stands as a watchful sentinel, shutting out or destroying the poisons carried to it by the portal circulation from the digestive tract, and made by the rapid elimination in a state of health of the toxic products by the intestines, the lungs, the skin and the kidneys. The toxic products of these several emunctories have all been carefully studied, especially those of the urine, notably by Prof. Bouchard, of Paris.[1]

The relation of this subject to the psychoses is most important. The subject was discussed at the Fourth Congress of Mental Medicine, held at Rochelle in August, 1893.

Drs. Regis and Chevalier-Lavaure, referees, stated[2] that they had been working on the line of autogenous poisons and had made many chemical and clinical researches to elucidate the relations of auto-intoxications to mental diseases. The toxicity of the urine was found diminished in maniacal states and augmented in melancholia. The urine of maniacal patients when injected into animals produces excitation and convulsions; that of melancholic patients, restlessness, dejection and stupor.

The mental disorders that arise during the course of the infectious diseases are clearly recognized as the result of pathogenic organisms, with the clinical observation that in the febrile stage the psychosis is usually an acute delirium resembling alcoholic; in the post-febrile stage, it is usually of an asthenic character, a state of mental cloudiness and confusion. The visceral psychoses are also in great measure the consequence of auto-intoxication, and they present as their clinical aspects if the intoxication is acute, delirium; if the intoxication is slow, a state resembling melancholia or more rarely paralytic dementia. Not only are we to recognize many of these mental diseases as auto-infections, but also such diseases as epilepsy, megrim, chorea and neurasthenia, and probably others of the nervous system.

We find in these cases a coated tongue, a foul breath, a gastric and intestinal indigestion, flatulency,

[1] Lectures on Auto-Intoxication in Disease.
[2] Bost. Med. Surg. Journal. Sept. 14 1893.

palpitation, irregularity of heart's action, a peculiar complexion, constipation, and occasionally diarrhea, all evidence of a condition of perverted function in the gastro-intestinal tract that will develop micro-organisms and toxines.

The indications for treatment are to prevent the development of the toxic products and to promote as rapidly as possible their elimination. To meet the first indication a carefully regulated diet is of paramount importance, and this must be selected with reference to the capacity of the patient. Milk and its preparations are the ideal diet, because under proper direction they introduce into the body the least amount of toxines or microörganisms, and leave the minimum amount of waste material; but we must bear in mind that this diet contains a considerable excess of fats and a deficiency of carbohydrates, and therefore will not properly nourish all persons. I know no more difficult and important question in these cases of auto-infection than the selection of a diet that will furnish nutrient material in abundance, with the minimum amount of intestinal and gastric fermentation. Each case must be carefully studied by itself, and the diet adjusted to the individual peculiarities. The patient should be weighed frequently to determine the precise condition of general nutrition.

To further promote the first indication, a judicious course of gastro-intestinal antisepsis must be maintained. The use of lavage and enteroclysis are valuable aids that are almost always required, and sterilized water is amply sufficient to produce all the results possible. The condition of gastric digestion should be carefully determined by analysis. If the amount of hydrochloric acid is deficient, antisepsis can be promoted by a combination of hydrochloric acid, with bitter tonics and aromatics such as the tinctura gentianæ comp. and tinctura cardamoni comp. If there is hyperchlorhydria then alkalies are indicated, and I frequently prescribe with benefit equal parts of salicylate of bismuth, magnesia and the bicarbonate of soda. Charcoal powder and oil of cloves are also useful agents in correcting gastric fermentation.

We need to-day a reliable gastro-intestinal antiseptic. Intestinal antisepsis is difficult to produce. A careful study and experience with many of the drugs recommended for the purpose have resulted in the almost exclusive use of benzo-naphthol, salophen, papaine (carica) and oleum carophylli. These must be given in full doses frequently repeated and can often be combined together with advantage.

The second indication that is, the elimination of the toxic products, is to be accomplished: 1, by judicious purgation, calomel and the salines being especially valuable; 2, by promoting renal elimination and for this purpose again calomel stands at the head of the list; 3, by increasing the activity of the skin, as by baths and massage; 4, by increasing respiratory activity, as by judicious chest gymnastics and the inhalation of oxygen. The use of static electricity by insulation and by the static induced current will materially aid in this work of elimination.

The treatment of the various diseases of the nervous system that result from auto-infection not only require the indication above mentioned to be fulfilled, but the damage done by toxines and microörganisms must be treated, and each individual case will require special treatment.

MORPHINISM IN MEDICAL MEN.

Read in the Section on Practice of Medicine, at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5-8, 1894.

BY J. B. MATTISON, M.D.

MEDICAL DIRECTOR BROOKLYN HOME FOR HABITUES.

It is a fact—striking though sad—that more cases of morphinism are met with among medical men than in all other professions combined. It is too true that a very large proportion of cases in general are found in our own fraternity.

In a paper, "Opium Addiction among Medical Men," presented in the *Medical Record*, eleven years ago—June 9, 1883, reference was made to the dismissal within a week of a half dozen doctors recovered from this disease, and attention called to the surprising frequency with which it occurs in this particular class. Another decade of professional work exclusively given to the betterment of such patients has brought no decrease in this number; indeed the reverse has quite steadily obtained, so that in a paper, "The Ethics of Opium Habitués," *Medical and Surgical Reporter*, Sept. 8, 1888, in a *résumé* of 300 cases, we noted 118 doctors, and of 125 most recently under my care, 62 were medical men; and the latest reference to my record shows a still larger proportion, being more than 70 per cent.

Again and again I have been asked with surprise, "Why do doctors so often fall victims to morphia, when they, more than all others, should know the risk attending its use?" Various factors make up the answer to this query. Insurance statistics prove that medical men attain a shorter average lease of life than those of other professions, and the causes that tend to this lessened longevity play a part in the rise of morphinism. It is also true that the wear and tear of their calling provoke a large share of painful non-fatal disorders. Neuralgia, in one or other of its protean forms—especially migraine—which leads the list in the genesis of this toxic neurosis, occurs among physicians with a frequency that may well excite surprise. Add to this the anxious hours, the weary days and wakeful nights which the experience of every busy doctor so often involves, and which, though acting indirectly, still swell the sum of causative conditions in this chronic toxemia, and little wonder that we have a soil specially rich for a sorrowful harvest if, unhappily, the seed be sown.

It has been asserted that medical men become morphinists through their calling involving frequent handling of morphia, but that statement in my opinion is not true. Erlenmyer shares in this disbelief. Druggists, whose vocation largely exposes them to the same risk—more so in the city than the doctor—do not often become morphinists.

A cause peculiar to the medical man, in some cases is that careless curiosity which prompts him—generally a junior—to note the effect of morphin upon himself and in so doing incur the risk of addiction. Obersteiner refers to such cases. A young physician asserted that while on hospital duty a patient was dismissed who had suffered from carcinoma of the stomach and been treated with morphia injections. Next day he returned, begging for more as otherwise he must die. This was in 1869, when chronic morphinism and its results were less known than now. As the doctor was inclined to think the patient was romancing, he tried the experiment upon himself to ascertain the effect, became a morphinist and never

recovered. Another case was that of a young physician who, being assistant in a physiological laboratory, thought himself an interesting subject for experiment. More than one doctor whose disease had a like origin has been under my care.

Another cause obtains with physicians to the same extent as in non-medical men, that is the all-too-frequent use of morphia which the modern practice of medicine involves. Of this there is no question. Indeed, it holds more largely with the doctor than with the layman, for the former fully aware of the opiate's power to ease pain, pressed by his duties to get relief with the least possible output of time, and declining to make himself an example of the precepts tendered his patient, as to the value of patience under suffering, that will permit the using of non-opiate remedies, or, if the morphia be demanded, which, at least, will secure its giving at infrequent intervals, or alternating with other anodynes, and so lessen the risk of addiction—lacks a certain inhibitory, so to speak, protection which serves as a shield to the non-professional patient.

Still another genetic factor and in my opinion the one which outranks all others relative to the frequency of this disease in medical men, is their ignorance or unbelief as to the subtle, seductive, snareful power of morphia. It is to me quite beyond belief that any doctor *fully* realizing how swiftly and how surely the trebly pernicious power of this drug takes one captive will deliberately give himself up to a servitude galling alike to body and mind, and which in most cases ends only with life. Such a suicidal course is opposed to reason, to common sense and to fact.

In expressing this disbelief you will quite likely infer my skepticism as to the common opinion regarding the ethical status of our *confrères* whose ill-starred fortune has brought them such wretched result. I have long held, and still hold, with steadily growing belief based on nearly twenty-five years study of this disease, and an acquaintance intimate more or less with the history of many hundred cases, that medical men do not become morphinists from an innate propensity to evil, from a merely vicious desire to indulge in the pleasures of the poppy—pleasures which, be it never forgotten, soon and surely give place to its pains—but rather that they are impelled thereto by force of physical conditions that, with the largely prevailing failure to realize the risk incident to incautious morphia using are practically beyond control. This phase of the subject need not detain us for it has been noted with detail in two papers, "The Ethics of Opium Habitués," *Brooklyn Medical Journal*, August, 1888, and *Medical and Surgical Reporter*, September, 1888.

In reviewing the various causes of morphinism in medical men, the most hopeful feature is the fact that they are largely preventable. In this lies the strongest incentive to presenting this paper, the largest promise that it may do good.

Regarding the cause first cited—the wear and tear of an over-active professional life—we must be specially sanguine who would expect to improve conditions along this line to an extent likely to largely lessen such untoward result; though it can not be denied that the cares of a medical calling are less exacting than a decade or two ago, and so figure less as a genetic factor in this disease; yet I am bound to confess the outlook much more encouraging should careful and concerted effort be made to make less active the other causes to which we have referred.

Regarding the misdirected zeal of the hapless seeker after self-evidence of the effects of morphia we can only again warn him—and earnestly—that the experiment is fraught with danger, and the rash act may prove his ruin, for the spark thus applied may set aflame that which will only be extinguished with life. He is a fool who does it; and the truly wise man will curb his spirit of inquisitive research along this line, if only on the score of personal well-being; besides no such self-sacrifice is called for, inasmuch as the peculiar effects of morphia, both as to blessing and bane, are now quite patent to all.

No one who has given the subject special thought will be likely to question an assertion that the use of morphin in the medical practice of to-day is in excess of what an actual need demands. And in direct proportion, more or less, to this excess stands the increase of morphinism. As a factor, applying to cases in general, it outranks all others though as regards medical men it holds in my opinion second place. Custom and convenience share in its causation. Custom, because experience has brought a belief in the anodyne-soporific power of morphia, which while well founded, has not been attended by an equally well-grounded belief in its possible power for ill. Convenience, because its promptly pronounced effect favors it as first choice when speedy relief is desired, and especially where as too often happens with the younger men in the profession, the wish to score such a brilliant result as may prove a stepping stone to rapid professional advancement outweighs a due regard for untoward remote effect, from which appreciation a frequent giving of morphia or any opiate should never, it is well to say, be exempt. This is a truism the force of which should never be forgotten.

Leading all others as a genetic factor in morphinism in medical men, is their failure to realize the insidious power of morphia to speedily get a grip, disturbing and destructive alike to functional well-being of brain and brawn, and in almost every instance, one too great to be broken by any self-effort they can command. At this writing I am consulted by a young physician whose case emphasizes this point. Sixteen months ago death left him wifeless and childless. In a specially unhappy moment of his grief he took a dose of morphia. It acted kindly, brought transient relief from his mental pain. A week went by before the second dose was taken and then—the old story: Quite mistaken as to the poppy power and his own strength to resist—again and again till his capture was quite complete. Commenting on his case he assured me he knew the risk attending morphia taking, and never should have incurred it had he fully realized how direful the result of that risk to him would be.

It is quite beyond credence that a doctor gifted with sound sense would wittingly put his neck in such a noose. Granting this, the only reason for taking such a perilous hazard is as before asserted, an inadequate appreciation of the morphia's power to enthrall.

Touching this point, enlarged experience confirms an assertion made ten years ago, that "the subtly ensnaring power of morphia is simply incredible to one who has not had personal observation or experience." One of the finest specimens of physical man-

hood we ever knew, a physician who survived the horrors of Salisbury prison when the death rate averaged 80 per cent., fell a victim after only one month's hypodermic using. Since then, case after case has been under my care in which the initial stage was still shorter. The most notable was an athlete of superb physique, who withstood the rigor of an Arctic winter as surgeon to a polar expedition, and then went down before a three weeks' daily quarter grain dose of morphia to ease the pain of an injured ankle!

So much for the genesis of this disorder. What the remedy? It is easy to moralize on the weak will—as many, mistakenly, are wont to put it—of our hapless brother living under this blight, but talk about "weak will" as a reason why strong men succumb to morphia—and I make bold to say that the man does not live who, under certain conditions can bear up against it—is twaddle. Far better is it to face the fact that morphinism finds most often its favorite victims in the noblest profession known, and then recognizing the causes that make this fact, bestir ourselves to such precept and practice as will tend to remove this blot on the scutcheon.

Can this be done? Very largely, yes. In this hopeful belief lies the one redeeming feature of the prevalence of this toxic neurosis in our own guild. Morphinism is on the wane in my opinion and I am optimistic enough to think the day not distant when it will be largely a thing of the past. But to reach this happy result it becomes the bounden duty of every physician to inculcate by teaching and by example the paramount importance of the causes we have cited that tend to the rise of this disease.

Two points call for special comment. These are the over use of morphia and the under thought of its danger. Regarding the latter, let me warn with all the weight I can command, every doctor who may be dallying with this drug or who may think its self-taking called for—and this warning holds with special force if the subdermic method be practiced—let me warn him that he is inviting disaster by jeopardizing interests vital to his well being, and let me urge him to pause and to ponder well whether, despite this warning, he dare take such risk. Let him not be blinded by an under estimate of the poppy's power to ensnare. Let him not be deluded by an over-confidence in his own strength to resist; for along this line history has repeated itself with sorrowful frequency, and—as my experience will well attest—on these two treacherous rocks hundreds of promising lives have gone awreck.

I have no wish to pose as an alarmist, but I tell you, gentlemen, that many a doctor who gives himself a daily hypodermic dose of morphia for a fortnight will come perilously close to the danger line—beyond which bondage begins.

Let him not chance it; rather let him, if the opiate demand be imperative, consign its giving to other hands; let it be by mouth; and oftener, let it be codeine which as an anodyne and sporific, has not yet had the measure of merit it deserves, and which, as tending to tolerance, is vastly less riskful than morphin. In a paper before the AMERICAN MEDICAL ASSOCIATION two years ago, "The Prevention of Morphinism," (reprint at command, and by the reading of which I would have every one of you the gainer) attention was called to the value of codeine. Enlarged experience has confirmed the opinion then expressed, and while I am glad to note the demand for it is steadily increasing, I earnestly urge its still larger use as one of the most promising factors to favor a decline of the morphin disease.

Regarding the over use of morphia, never was there so little excuse for it as now, for never were the means at command to ease pain and bring sleep equal to those of to-day. Modern medicine is richly equipped in this regard, and if these resources be fully availed of, it will go far in a decrease of this ill.

As tending to this, teachers in medical schools should realize that they have opportunity to wield great influence for good and by word and deed they should improve it. To do so would strike right at the root of this evil, for I truly think the junior members of the profession are the greatest sinners in this regard; and if by timely counsel from their preceptors and college instructors the thousands who year after year begin a medical career can be brought to believe the danger incident to an incautious or needless giving of morphia, and then shape their practice in keeping with that belief, the good work will be largely done.

Slowly yet surely the therapeutic trend is in this direction. More and more the older medical men, impelled by larger wisdom or an experience often unhappy, are quitting the syringe; more and more rarely are they using morphia. The influence of this example must make itself felt on the younger men, and when to this is added the teaching we have commended the dawn of a better day will not be distant. May that good time coming soon come.

INFLUENCE OF ATMOSPHERIC PRESSURE ON THE PREVALENCE OF PNEUMONIA.

Read in the Section on Practice of Medicine, at the Forty-fifth Annual Meeting of the American Medical Association, held in San Francisco, June 5–8, 1894.

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More than ever, physicians try to discover the cause of disease. Great discoveries have been made and for a number of diseases certain bacilli have been found to be the specific agents. More than ten years ago it was believed that such a bacillus had been discovered as the direct cause of pneumonia, and many consider pneumonia to-day an infective disease caused by a diplococcus. Still it is a relatively rare occurrence that this bacillus pneumoniæ is found in pneumonia, and the riddle of the nature of this disease is by no means solved.

If I am ready now to bring indirect proofs of the nature of pneumonia before you, without referring to bacillar origin, I am induced to do so from the extraordinary exactness of such proofs. We understand that under the heading of pneumonia a number of different forms of this disease are included and we have reason to belive that a small percentage of it is certainly caused by a bacillus. Such may be the case in epidemics in prisons, etc. In this paper I refer to the two most common forms; fibrinous pneumonia and broncho-pneumonia. We know that these two forms appear in certain years on certain parts of our globe in epidemics, and that the greatest epidemics are probably isochronous with epidemics of influenza, other acute diseases of the respiratory organs and a great mortality from phthisis. We

know that they affect principally children under 5 years of age and adults above 50 years, and we know that the epidemics occur almost invariably in our winter or spring season in the northern hemisphere.

The continents of our globe suffer from epidemics often in the same year, and often in the same month, and furthermore different parts of the continents show a greater prevalence of the disease than others. Parts of the southern hemisphere have epidemics at the time of their winter and spring. Edward F. Wells, in his "Study of Pneumonic Fever," published in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, describes the territory suffering mostly from pneumonia as follows: "Beginning at the poles, its frequency increases in a gradual manner until the maximum is attained at a certain latitude in either temperate zone, and from these points it diminishes as we approach the equator." This description furnishes at the same time a concise statement of the extent of high atmospheric pressure on our globe, and when we follow Wells and Hirsch[1] in their enumeration of the different countries, as subject to epidemics of pneumonia, and the seasons or months in which such epidemics have prevailed in such countries, we get an almost accurate description of the areas of high pressure, as distributed over the globe, and of the season when they prevail. Both hemispheres have a belt surrounding the globe and marked by about 15 to 30 degrees latitude, where the mean pressure exceeds 762 millimeters, thirty inches. North and south of this belt the mean pressure is again diminished. Centers of highest and lowest pressure which are constant in one season of the year, as in winter for instance, have almost the reverse character during the opposite season, with a more or less gradual turn from one to the other—at least above the continents. In January as the representative of winter time, we find the area of highest pressure on our globe, in Siberia or East Asia. This area has its extension north and south over the greatest part of Asia, but spreads principally in a westerly direction into Europe which is almost entirely under a pressure of 752 millimeters (thirty inches). Areas of a somewhat higher pressure exist at that time in northern Italy, Switzerland and the southeast of France, in the center of Spain and of Sweden and Norway. All of the United States and most of British North America, Mexico and Central America have high pressure in winter time. On the southern hemisphere only part of Chile and Peru, the south end of Africa and a small part of southern Australia come under the influence of high pressure during our winter. The oceans have certain constant areas of high pressure during the entire year. All the above named parts of our continents with few exceptions have low pressure in the opposite season of the year. It could naturally be inferred that if an increase of air pressure would affect human health, that such disturbance would be experienced at that season and in those parts of our globe, principally and first, when and where centers of high pressure appear. At the time of low pressure such effects would be least noticeable or wanting.

I shall not speak of what we know about the effect of high pressure on animal life. We know very little about it but we do know that the decrease of pressure, as experienced in higher altitudes, is easily borne to a certain degree. It is also known that great oscillations of pressure during a short period, are probably not detrimental to our health. Certainly the effect of excessively high pressure, continued for a great many days or weeks, has not been studied. The parallelism of the extent of high pressure and the prevalence of pneumonia at certain seasons invites us to examine more closely into their relationship—although strange to say, the fact of this parallelism has not been noted by any author. Wells and Hirsch and every other writer on the subject discards air pressure as a causative factor. The reason is that whenever an attempt has been made hitherto to follow up air pressure in its relation to pneumonia the mean pressure, daily or monthly, or the mean maximum or mean minimum pressures have been consulted. But if we wish to detect immediate effect of an extreme pressure, high or low, we can not judge from the mean figures. For the same reason mean figures of temperature would be deceptive. If a cold spell comes over the country as California or Florida, for instance, it may happen that the extreme minimum temperature of one or more degrees below zero is encountered in a locality otherwise exempt from such freezing temperature. This event happening perhaps once in ten years for a few days or one day in one month, may suffice to kill certain vegetation. The mean minimum temperature of such a month may not at all indicate the extreme of temperature which had such an effect. In a similar manner, atmospheric pressure, when augmented in certain years to a great extreme and if such extreme pressure continues for a period of days or weeks, may affect animal life, where the figure of the mean maximum pressure does not differ from that of other years which had no such deleterious effects. The extremes of atmospheric pressure as they come to us in daily life have never to my knowledge been scrutinized as to their relation to diseases to which animal life is prone. On Chart 1 are found the extremes of pressure as observed in every month of ten years or more, in different cities of Europe and America.

The figures of these extremes are all corrected for temperature (reduced to 0 Celsius) and for instrumental error. These lines show a certain periodicity in every one of tho many years given, in having a lowest extreme of high pressure always in one of the summer or more rarely fall months, and in having the highest extreme always in one of the winter or more rarely one of the spring months. In some years more than one month will show such highest or lowest extremes.

Speaking only of the extremes of high pressure, the year 1882 has the highest extreme during January in Paris, London, Berlin and St. Petersburg, and in February in San Francisco. In 1883 the highest extreme is found in February in Paris, London, St. Petersburg, New York, San Francisco and New Orleans and in March in Berlin. In 1884 it is again in January in every one of the cities with the exception of St. Petersburg. In 1885 the first three have it in December, the other four in January. In 1886 five of the seven cities have the highest pressure in February and November. In 1887 six of these cities have it in February and only one, San Francisco, in January. In 1888 every one has it in January. In 1889 every city has it in December. It is the month in which grip first appeared. In 1890 every city shows high extremes in a number of months. In 1891 it is principally November and December which show the

[1] Hirsch Handbuch der Historisch—Geographisoheu Pathologic, 1886.

high extremes. In 1892 it is February, March and April that show the highest figures. The same regularity is found when we compare the different cities in the different years in regard to the month or months in which the lowest figure of extreme high pressure is noticed.

Sometimes this month will be early in the year as in 1884, sometimes in July as in 1887 and 1888, sometimes in August and September and rarely in October, but in most years different cities have the lowest high pressure during the same month. Still it is not unusual that the high pressure will remain low for two, three or four months. London and St. Petersburg being rather out of the centers of high pressure exhibit the greatest irregularities. San Francisco and New Orleans, remaining also in summer somewhat under the influence of high pressure, show the greatest regularity and the smallest amplitude. The extremes of low pressure are highest in summer time or at the beginning of fall, and lowest generally at that part of the cold season which has the highest figure of high pressure. Generally the extreme of low rises in one month and descends in the following, showing an almost continuous zigzag line. I add that in some years the extremes of low pressure have the same *minima minomorum* in different cities during the same month. In short, we may say that *periods of excessively high pressure appear in certain years in different cities of the northern hemisphere in the same month and that this month is generally a different one in the different years.* The same regularity we notice for the time of low pressure at the opposite season of the year. On Charts 2, 3, 4 and 5 we find again the figures of extreme pressures, and besides, the figures of mortality from phthisis, pneumonia and bronchitis for Berlin, Munich, New York, Cincinnati and San Francisco.

During the twenty-two fiscal years (June 1 to June 1) for which I present these figures for San Francisco, the mortality from pneumonia and consumption was highest first in the year 1889–'90 when influenza first appeared, and then in the winter of 1891 to 1892. In none of the twenty-two years had there been such a continuous rise of pressure, covering a period of eight months from June to March, as in the year the grip appeared, although the difference of the highest and lowest "high" amounted only to 9.39 millimeters (.37 of an inch). This difference amounted to 12.70 millimeters (.50 of an inch) in the winter of 1891–'92 and was reached in four months from August to December. The highest rise happened in December, and the highest figure of pressure of the twenty-two years reached. This was accompanied by the heaviest mortality from pneumonia in the twenty-two years, in San Francisco.

A similar rise occurred in 1887 to 1888, from August to January. The high rise in January at that time also being followed by a very high mortality from pneumonia.

During the twenty-two years, the extreme of high pressure was lowest five times in September, seven times in August, four times in July, once in June, four times in two of the above months during the same year. The month during which the mortality from diseases of the respiratory organs was lowest was in nine of the nineteen years, for which records are kept, the same as the one in which the extreme of high pressure was lowest. In seven years the mortality was lowest one month after. In one year one month before, in one year two months before and in one year four months before the month in which the extreme of high pressure was lowest. The mortality from these diseases was highest in eight years of the observed eighteen years during the same month, in which the high pressure was highest; in two years, one month later; in four years two months later, and in two years one month before the pressure was highest. This month was January five times, December four times, March six times, April twice and November once. Thereby it is demonstrated that the lowest mortality from pneumonia is generally or always found during that month or near that month which has the lowest figure of the extreme "high" and the highest figure of the extreme "low" pressures. When the high rises during the fall then the figure of mortality rises. If it happens that the low shows a lower extreme at the same time, and if this descent continues for the following month or months in which the high pressure continues to rise, then the figure of mortality shows a higher figure in proportion to this occurrence. However, it happens only rarely and not in every year that the low shows a continuous decline when the high has its incline. In some years it is found that the mortality is not in proportion to the ascent of the extremes of high pressure, as for instance, 1890–'91; then the continuity of the rise and perhaps the extreme fluctuations of the low during that period are the important features.

Any one who is conversant with figures of atmospheric pressure, as given by the barograph for the day, week or month, will know that the figures of extremes of pressure will hardly ever represent the result of an oscillation, happening only on a certain day of the month. Chart 6 exhibits the daily high and low extremes for two seasons, December—March, in San Francisco and helps to explain how large a part of the month may be under the influence of the one extreme of the month. In the instance given on the chart an extreme of pressure above 774.7 millimeters (30.50 of an inch) is found eleven times during the season the grip appeared first and only one time the season previous. Chart 7 demonstrates for Berlin how the weekly extremes correspond with the weekly figures of mortality. They show plainly that the mortality rises generally from the very week in which the pressure rises, and that the period of high mortality sets in after the pressure has become unusually high. It is seen here again that if during a rise of pressure for one or more weeks the low descends for the same period, then the mortality shows a corresponding increase and *vice versa*.

Every city as exhibited on the other charts shows the same regularity and periodicity of mortality. In every instance the law repeats itself, that *during the month in which the extreme of high pressure rises to a higher extreme, and that of the low pressure to a lower extreme, the mortality increases correspondingly*, but it does so in proportion to the higher rise and not to the lower fall. This law shows such *regularity, that in any given month of the year probably in any part of our globe we may be able to predict in future whether a greater mortality from pneumonia may be expected or not.* For San Francisco, for instance, during the twenty-two years, the lowest extreme of high pressure was never higher than 763.3 millimeters (30.05 of an inch) and never was found later than September. If then, as in the season of 1891 to 1892, the

highest extreme in August was only 760.0 millimeters (29.92 of an inch) and in September rose to not quite 762.0 millimeters (30.00 of an inch), then no increase of mortality could yet be expected. In October it rose nearly 2.5 millimeters (.1 of an inch) and the same in November, but during the same period the extreme of the lowest pressure had risen to the same extent as the high pressure. This precluded the appearance of high mortality. During December the extreme of the high had risen higher than during the two months previous, and the low had descended lower at the same time to such an extent that a high mortality could be expected, and San Francisco experienced during that month a very high mortality from pneumonia. During January the pressure showed the reverse from December and the mortality fell rapidly. The same in February. *Every one of the different cities shows the same relation of mortality from pneumonia to the course of atmospheric pressure.* The mortality from bronchitis runs almost parallel to that of pneumonia and the one of phthisis shows about the same direct relationship. Wells gives the following figures of mortality from pneumonia per mille of population for the following cities and countries:

Berlin 52 years, 1.21 per mille; London 17 years, 1.69 per mille; Paris 26 years, 2.56 per mille; Boston 42 years, 1.23 per mille; Cincinnati 20 years, 1.54 per mille; New York city 32 years, 2.03 per mille; Philadelphia 48 years, 1.30 per mille; New Orleans 2 years, 1.5 per mille.

I found that the figure for San Francisco 1870 to 1884 was 1.4 per mille, and during 1891 to 1893, 1.5 per mille. For all cities on the immediate coast line of California, it is 1.6 per mille; and excluding San Francisco, only 0.8 per mille. For cities in the coast valleys the figure is 1.3 per mille; for the great central valley it is 1.2 per mille; and for Southern California, inland, it is only 0.4 per mille. Wells found very low figures for Ceylon, 20 years, 0.7 per mille; Jamaica 0.3 per mille; Newfoundland 0.3 per mille. The three latter are outside of centers of high pressure and as Chart 8 shows, Southern California and the immediate coast line with the exception of San Francisco, do not have the high pressure found in the coast valleys and in the central valley.

The good effect that Southern California is reported to have on diseases of the lungs is put in a new light when judged by the character of atmospheric pressure. Normal air pressure shows the least difference during the year, of any California station, in San Diego; next in Los Angeles and San Francisco, and greatest difference is found in the stations of the central valley. Mortality from pneumonia shows similar proportions. It has been noticed that a northerly wind has generally been prevalent during epidemics of pneumonia. Since we know that the relation of wind to air pressure is a constant factor and that northerly and northeasterly winds prevail inside the area of highest pressure during winter all over the northern hemisphere this appears to be an additional proof. From this direction of the wind it will be clear that areas of high pressure will generally travel from East to West. We know that they travel with a velocity of from 500 to 1,500 miles a day. It is no wonder, then, that we find *maxima maximorum* of pressure in different cities of the northern hemisphere during the same month of some years. Ziemssen in his work on pneumonia said a great many years ago: "After all we can not help but assume that there must be general conditions, perhaps multiplied by local circumstances, which appear and disappear simultaneously in great expanse of space. Of what nature these influences may be is perfectly dark. We would not be forced to think of miasm or contagion. We are more led to believe that fluctuations of atmospheric conditions extending over great areas of the surface of our globe, at the same time, furnish an analogy." To-day we know that atmospheric pressure will appear in such eruptions which are felt at the most populated regions of the northern hemisphere in the same month and perhaps week.

In over 80 per cent. of the forty-nine years observed by me in Berlin, Munich, New York, Cincinnati und San Francisco, a direct coincidence of the highest and lowest figures of air pressure and mortality from pneumonia, is fully established.

If we take into consideration the inaccuracy of mortality statistics in general, then the high percentage must appear striking. There is certainly a parallelism between the two figures that we do not find for any other disease, when compared with this or any other meteorologic feature. The simultaneous appearance of the great epidemics of pneumonia in late years, greater than during the many years previous, together with a continuous rise of high pressure and the great mortality from other acute diseases of the lungs during the same period, the reappearance of influenza at a time when high pressure had continued to exercise its influence for an unusually long period, these circumstances point to the fact that there must be a predisposing cause in high pressure. The figures for Berlin and Munich during the season, 1889-90, indicate directly that the figures of highest general mortality are parallel to the extremes of high pressure as they appear during the different weeks. In both cities the extreme of the highest pressure coincided with the figure of the highest mortality, which had been increased enormously during that period by mortality from phthisis, acute diseases of the respiratory organs, heart disease and old age. Influenza itself furnished the least number of deaths. If a certain increase of air pressure will have such an effect upon the health of the people as to cause pneumonia, or to make them subject to pneumonia, and since "feeble" and a low action of the heart are identical, the first object of future research would seem to be to study the peculiar action of increased air pressure on the blood or circulation of blood in the respiratory organs. If an appearance of an area of high pressure may have such disastrous effects upon human life, then we will not wonder any more why the incubation of pneumonia or influenza may last only hours or a day, why ships on the ocean may get an epidemic of either disease, traveling into an area of such pressure, why remote islands may suffer from these diseases without a possibility of a transferred infection. People living on high mountains may have to suffer when the air pressure becomes relatively higher during such periods. Feeble persons who had an attack of pneumonia one month or one season, may encounter a repetition of the attack as often as the high pressure is repeated. It is almost a relief to know that a phenomenon exists which shows a parallelism to the cause of influenza or pneumonia. Still what we know to-day is not suf-

ficient to explain in which way an extreme air pressure may cause pneumonia. We know from experiments that high pressure will reduce the force of the heart's action. The pressure in the arteries is diminished by it and at the same time a greater amount of blood is found in the inner organs. All this may be called a *postulatum* for the beginning of pneumonia. We practitioners will have a chance in the future to prepare those intrusted to our care, to acquire a proper power of resistance during the time the appearance of a high extreme pressure is telegraphed over the country by the weather bureau, and I trust that it may become more important to us in future to know whether an extreme "high" is hanging over our heads than whether it will rain or be cold on that day. The ideal for the physician is not to discover the cause for disease, nor to cure it, but to prevent it, and if my remarks to-day should be a proper move in that direction it would be another stimulus to continue the arduous and yet pleasant life of a physician.

CEREBRAL LOCALIZATION—WHAT IS KNOWN, WHAT SURMISED, AND WHAT IS ITS SURGICAL VALUE?

Read in the Section on Practice of Medicine, at the Forty-fifth Annual Meeting of the American Medical Association, held in San Francisco, June 5-8, 1894.

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The physiology of the nervous system and the functional differentiation of its component parts has been but recently investigated, and is now in many particulars so well established that it seems proper before entering the domain of neurologic pathology to briefly recapitulate, not only that which has been scientifically proven, but the many speculations of eminent investigators that are as yet mere hypotheses. Without going into a detailed history of the evolution of cerebral physiology, I will refer to the great advance made by the anatomists of the seventeenth century. Before that time anatomy and physiology were necessarily theoretical, for as a basis they rested on speculation and tradition, not on the dissection of the human body. But the opinions held regarding the nervous system were even more crude than those that prevailed regarding other portions of the body, for the philosophers, led by Aristotle and Herophilus, had outlined a physiology based on their psychologic theories, and twenty centuries had served but to confound the already existing confusion.

Willis accomplished for the nervous what his contemporary, Harvey, did for the circulatory system. He not only delineated and named the cranial and spinal nerves, but recognized the important fact that the brain is not only divided into gray and white matter and correctly explained the functions of each, but also showed that the gray matter was convoluted simply as a wise provision for inclosing the greatest surface in the smallest space, realizing that there was a direct ratio between intelligence and the volume of gray matter, and further suggesting the possibility of its function being still more differentiated.

The next great advance in the differentiation of the nervous system was Sir Charles Bell's discovery that the spinal nerves subserved the two-fold purpose of sensation and motion; the one entering through the posterior root bearing sensation from the periphery, the other solely motor, making it exist by the anterior root. This he proved by experiments on living animals and his results, published in 1811, were elaborated with so much detail that our own text-books do not contain any amplification of the theory there propounded. When in 1870 Fritsch and Hitzig announced the result of their experiments on dogs and monkeys, they were but confirmatory of views already advanced by Hughlings Jackson, whose investigations, both clinical and post-mortem, had suggested the existence on either side the fissure of Rolando, of special centers which presided over the movements of the leg and arm. But even earlier than this, Dax had pointed out the close relationship existing between aphasia, right-sided hemiplegia and injury of the frontal convolutions; though it was Broca who definitely located the speech center at the base of the third frontal convolution of the left hemisphere.

The original experiments performed by Fritsch and Hitzig consisted in the removal of a portion of the skull of dogs and monkeys, exposing the brain and irritating the cortex. Before this it had been believed that irritation of the cortex resulted only in convulsions, but when electricity was selected as a stimulus and very weak currents used it was found that irritation of certain convolutions produced definite motions, and so localized were these areas that it was possible for the experimenters to foretell the motion that would follow the application of the electrodes to a given area. This conclusively proved that there was some definite relation existing between these localities and movements of various members of the body.

Ferrier and Horsley in England, and Monk in Germany, modifying the methods of Fritsch and Hitzig, have so extended and varied these experiments as to eliminate all possible errors; the areas have been so incised as to separate them from other cells of the cortex, and portions of the cortex containing these areas have been removed and the resulting paralyses noted. Thus have the old theories been revolutionized and most plausible arguments advanced to support the assertion that not only the special senses, but that motion and sensation are located in well defined and accurately differentiated regions of the cerebral cortex.

So brilliant and so essentially scientific were these experiments that the deductions made from them as to cerebral localization have been accepted not only by the majority of physicians, whose judgment can not be based on personal investigation, but especially by many leading neurologists. But this acceptance is not universal, and it may be said that neurologists are ranged into three schools.

The very weighty names of Brown-Séquard and Goltz appear among those who altogether repudiate localization in the sense that one portion of the cortex intrinsically so differs from another as to possess a different function. They believe that each half of the cerebrum acts as a whole, but that certain portions may be educated and probably do preside over the special senses, motion and sensation.

The second school, represented by Exner, Obersteiner and other conservative neurologists, teach "that certain regions of the cortex are to a greater extent than the rest associated with certain functions." Obersteiner defines his position as follows: "Individual centers and cortex fields are not to be

considered as sharply outlined and definitely marked off from neighboring regions; the so-called centers are rather the spots of maximal relation to functions which fade away into neighboring areas. Hence it follows that the cortex fields to a certain extent overlap one another. We shall speak of the centers in this sense as comprehending the spots of maximal physiologic relation."

The third, known as the English school of localizers, is led by Ferrier, Horsley and Beevor. These teach the absolute segregation of centers in the cortex; that they intrinsically differ the one from the other and that consequently their functions differ, and that there are not only regions presiding over the special senses, sensation and motion, but divide the last into finger, hand, arm, mouth, etc., centers; and further contend that these areas are sharply defined, are easily located and, when exsected, produce a permanent paralysis in that member of the body over which they preside.

It is this last which has brought this subject into such prominence. Granting that either the first or the second school be right, it is only a step forward in the study of cerebral physiology, but if the teachings of the abrupt localizers be correct, a vast field

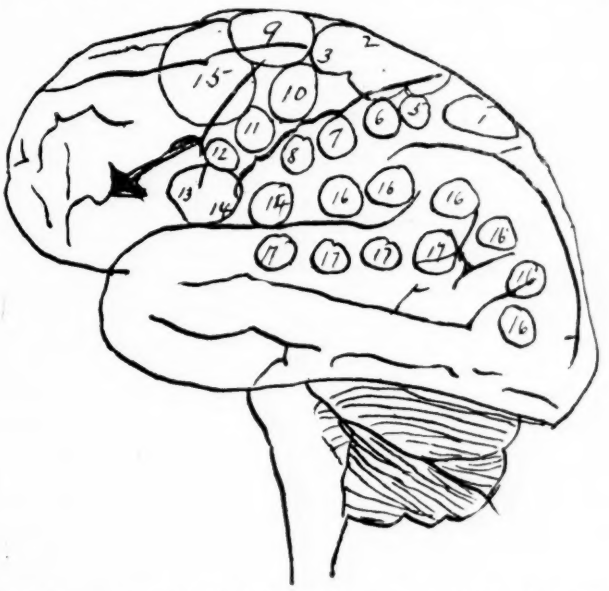
Left hemisphere, brain of monkey.

of practical importance has been opened and cerebral surgery will at least receive a scientific recognition, rather than occupy the invidious position it even yet holds among conservative surgeons. For this reason it seems well to review the work of these investigators and to point out what they have demonstrated, as well as the many questions that are still under investigation and to show that some, at least, are unsolvable.

What has been proved is that when certain regions of the cortex of the brain of monkeys, dogs and other animals are irritated by mild currents of electricity, motion is produced in corresponding parts of the body. That portion of the cortex which has been shown to be closely associated with motion is known as the Rolandic region, from the fact that it is composed principally of the two convolutions which are separated by the fissure of Rolando, as well as the parietal lobule.

This region is subdivided into special centers. Irritation of the parietal lobule and upper junction of ascending frontal and parietal convolutions produce advance of the opposite hind limb, flexion of thighs and toes as in walking. When the middle portion of the ascending convolutions is irritated, movements of the hand and arm follow. The lower junction of the convolutions are in like manner shown to preside over, or at least closely associated with, movements of the mouth, tongue and nose. Posteriorly, near the angular gyrus, irritation results in movement of the eyes and eye-lids, and still farther downward on the superior temporo-sphenoidal convolution there is pricking of the opposite ear, head and eyes turn to the opposite side and the pupils widely dilate. Other regions, though irritable, are not connected with coördinated movements, while much of the cortex is insensitive. Thus is it shown that motor activity, though present to the greatest extent in the so-called motor area, is not confined to it. These experiments have also demonstrated the fact that while each hemisphere is closely associated with the opposite half of the body, to a subordinate degree it also presides over the same side.

What is surmised? That the brain of the monkey and other animals resembles the brain of man to such a degree that what is true of the one holds equally true of the other; that both in man and animals the brain is so differentiated that certain areas



preside over allotted functions and that they are capable of being subdivided. Especially is this true of motion. To a lesser extent it is true of the special senses, and the brain has been mapped out into centers of sensation, hearing, sight, smell, taste and speech, and these have been located as follows:

Motion.—The ascending frontal and parietal convolutions, their superior junction and the paracentral lobule. This, known as the Rolandic or motor region, has been subdivided into finger, hand, arm, mouth, etc., centers, every muscle or group of muscles being represented by a definite area in the brain cortex. In fact, the cortex may be compared to the key-board of a piano, and just as harmony depends on the combination of notes which are touched in succession, so can any given action or series of coördinated movements be obtained by irritating the proper area of the denuded cortex. These conclusions are the result partly of comparison with animals and partly of pathologic research, and may be thus summarized:

Superior parietal lobule (1) advance of hind limb. Upper portion ascending parietal (2, 3, 4),

complex movements of leg, arm and trunk as in swimming. Ascending parietal (5, 6, 7, 8) individual and combined movements of fingers and wrist of hand; prehensile movements. Posterior extremity of superior frontal convolution (9) extension forward of hand and arm. Ascending frontal (10) supination and flexion of forearm. Lower third of ascending frontal and junction of ascending frontal and ascending parietal (11, 12, 13, 14) movements of mouth and nose. Superior and middle frontal (15) and supra-marginal lobule and angular gyrus (16) Movements of mouth, eye deviates, pupils change and head turns (sight). First temporal (17) pricking ear (in animals), head turns and pupil dilates (as in hearing).

Visual Center.—In Ferrier's original experiments this center was located in the angular gyrus (16), as blindness resulted when this was destroyed. But other operators claim that sight is centered in the occipital lobe (16), and showed that when the gyrus only was destroyed and the life of the animal was prolonged beyond a few days, sight returned. On destroying the occipital lobe with the angular gyrus the resulting blindness was more prolonged. Ferrier says: "After extensive destruction of the occipito-angular region in one hemisphere, the temporary amblyopia of the opposite eye leaves a more enduring homonymous lateral hemiopia to the opposite side, yet unless the destruction of the cortex is absolutely complete (and in none of the recorded experiments was this the case), restoration occurs, to such an extent at least, that the defect ceases to be perceptible by any tests applicable to the lower animals." In other words, provided this be the center, some other portion of the brain assumes the function and is able to successfully receive and transmit visual impressions. It is further claimed that the simultaneous destruction of occipital regions in both hemispheres may produce permanent blindness, and Ferrier even goes the length of claiming that these regions are the central expansions of the optic tracts and consequently structurally differ from other centers, and that in his experiments atrophy of the nerves and tracts has followed destruction of these zones. But localizers are by no means agreed among themselves as to many of the minor facts, though the occipital lobe is the accepted center.

Auditory Center.—Experiments made on the lower animals as to the center of hearing are, from the very nature of the facts to be elicited, extremely unsatisfactory. It has been found impossible to eliminate the complications incident to the difficulty of intelligently interpreting the phenomena following the various lesions. Experiments seem to point to the superior temporal convolutions and it is claimed that post-mortem researches bear out this location.

Olfactory Center.—This has been selected from purely anatomic considerations. The roots of the olfactory nerve have been traced to the hippocampal region and the sense of smell has been assigned to the tip of the temporo-sphenoidal lobe. Comparative anatomy teaches us, however, that the olfactory bulb itself is a portion of the brain, and it would seem that if any portion of the brain were selected for special functions this would alone preside over the olfactory sense.

Tactile Center.—There is no question in cerebral localization more undetermined and apparently more undeterminable than is this. It is well known that the sensory fibers when they pass through the internal capsule are differentiated from the motor tract, but the region of the cortex to which they are distributed has not been determined. Ferrier and his school locate this center in the hippocampal region, but the majority of neurologists agree with Fleisching who believes that the cortical fields of motion and sensation overlap each other, both occupying the Rolandic region.

Center of Speech.—By this is meant an inability to articulate, not to properly understand and appreciate what is heard. Situated at the base of the third frontal convolution of the left hemisphere, known as Broca's convolution, it has received much attention at the hands of pathologists, and medical literature teems with post-mortem facts that prove the close relationship this region bears to articulate speech. It has been further claimed that only in right-handed persons is this center on the left side, while in the left-handed it occupies a corresponding position in the right hemisphere. There is no fact in cerebral localization more generally recognized by the profession than is this speech center, and it may be a matter of surprise that it is not included among those questions of cerebral physiology which has been proven. Nevertheless, that this center presides solely over speech and that its functions can not be assumed by other portions of the cortex has by no means been demonstrated. It is not possible to here enter into a discussion of this point, but it can be stated positively that while many facts point to a connection between this center and articulate speech, it has been conclusively shown that tumors involving this region have not produced aphasia. One such well authenticated case is sufficient to overcome any number of facts which are adduced to support the theory of a well defined speech center. Not only have tumors been found which interfered with the Broca convolution, but embolisms have been recorded in which this whole area was softened and disintegrated without causing a loss of speech. Leading authorities, notably Bateman in his recent work on aphasia, take the middle ground. While they recognize the close relationship between the destruction of the Broca center and aphasia, they deny absolutely that it is in the strict sense of the term a *center*. They believe that it, as well as other regions of the brain bear some, as yet undetermined, relation to the faculty of speech. With all the light before us the most that can be said is that when the Broca center is involved in some destructive process there is often right-sided hemiplegia with aphasia.

From the above summary it will be seen that very little has been demonstrated. The great majority of questions that are of practical importance are by no means settled. The one fact that coördinated movements may follow electrical irritation of the motor area is regarded by many neurologists as simply one of the curiosities of physiology, and they by no means accept the deductions which the localizers have drawn from such experiments.

Ferrier explains these phenomena by supposing that cells in certain areas—not necessarily disassociated because a sulcus happens to intervene—possess an essentially motor function and that when irritated this irritation passes directly to the white fibers which spring from these cells, and that these fibers are collected into differentiated bundles, pass out through the internal capsule, become the anterior

and lateral pyramidal tracts and convey impressions through the anterior cornua into the anterior root. In other words, he teaches that the motor area is the cortical expansion of the motor tract and that consequently the cells from which the fibers spring are functionally differentiated from other cortical cells. Those who are not localizers find much to criticise even here. No one familiar with Ferrier's work doubts the experiments recorded. What they are not willing to accept is the legitimacy of his conclusions. Granting that the brain of the monkey differs from that of man merely in number and complexity of convolutions, rather than any intrinsic quality, and that the cells of the cortex are irritable, they still maintain that each cell is so closely connected not only with adjacent cells and those in neighboring areas, as well as widely separated regions even of the opposite hemisphere, but that an irritant could not be applied which would not equally irritate all the ramifications and connections of these cells. But even the irritability of the cortex is denied. It is well known that nerve fibers can be irritated by many agents, both chemical and physical, but it has not yet been proved that the cerebral cortex is susceptible to other than electrical irritation, and this electrical irritation is attributed to its quality of diffusion. It has been shown that when the exposed sciatic nerve of a frog or the still more delicate galvanometer was connected with the brain, the application of even light currents at a distance resulted in movements of the leg or deflection of the needle, thus showing that there was extrapolar conduction. Therefore, it is claimed that the electricity does not necessarily irritate the cells of the cortex, but may penetrate to the white fibers as they pass through the internal capsule. It is conceded that in this location the fibers are differentiated and that they are susceptible of irritation. The so-called motor region is therefore "motor," only because it happens to be contiguous to the internal capsule, and Dupuy, of Paris, points out the further fact that this region is unusually rich in deeply penetrating blood vessels: "The pia mater over the Rolandic convolutions is almost a complete network of vasomotor fibers and cells, and blood vessels which penetrate into the convolutions. One system of blood vessels only ramifies and ends in the cortex proper; the other enters the white substance by means of larger vessels accompanied by nerves and ganglion cells. It follows from this arrangement that the cortex proper is much more vascular and the white substance or fibers a great deal less so; and moreover that while the vessels irrigating the cortex are spread well over, those going into the white substance are isolated from one another. Now I have shown that those points which when 'excited' by electricity give rise to a motor action, coincide with spots where arteries with nerves penetrate into the white matter or strands of fibers. The best method to demonstrate this fact consists in injecting one carotid artery after having marked with ink the position of the motor centers ascertained beforehand by means of electricity."

Ferrier and his school while not denying the diffusibility of electricity claim that in their experiments its action can not be thus explained. Ferrier says:

"Irritation of the ventricular aspect of the corpus striatum causes general contraction of the muscles of the opposite side of the body; and it is impossible by applying the electrodes to the surface of this ganglion to produce differentiated contraction in any one muscle of a muscular group." "We know therefore by direct experiment what irritation of the basal ganglia should produce; but the phenomena of irritation of the cortex are of a very different order." And again: "The great and significant feature of the reactions produced by electrical excitation of the cortex is that they are definite and predictable and vary with the position of the electrodes. But there is no fact more strongly urged by the localizers than that of the differentiation of white fibers in the corona radiata and the internal capsule, and Ferrier would be the last to deny that could these fibers after differentiation be separately irritated that corresponding movements would ensue. In fact this is far better established than is cortical differentiation. Dupuy claims that the electricity following the penetrating blood vessels and being so circumspectly applied to the strands is capable of producing coördinated movements—and at least in his recent writings does not say that this irritation necessarily takes place in the basic ganglia.

Another point that has given rise to controversy is the interpretation of the results that follow destruction of the cortex. Having measured the strength of the minimum current that will produce motion, the cortex is sliced off and left *in situ*. It is found that on reapplying the electrodes a stronger current is required to produce the same movement. The localizers claim that in the one case the electricity acted physiologically, in the other physically, and point to the increased strength of the current as proof. Their opponents explain the necessity of the increased currents because of the two new surfaces which have been created and the coagulation that necessarily takes place in the cut vessels, and they moreover urge that no better proof can be adduced that the electricity acts by diffusion of current than the fact that motion will follow the application of electricity to the cortex, even after it has been mechanically separated from the brain and lies merely in apposition. Another fact that is claimed will substantiate this same view is that when the cortex is frozen it is still susceptible of electrical irritation, a statement which Ferrier denies but other and later authorities consider well established.

Another experiment of Frank's consists in freezing the motor center and then irritating the hard frozen surface. It is found that whereas before the freezing the motor action in the limb was longer in duration than the current used and was epileptic, and besides only occurred after a lapse of about six and one-half hundredths of a second, when the same current is applied during the frozen state, the time of reaction is only about four and one-half hundredths of a second and the contraction is only tonic. The claim is made from these results that the reaction time is greater (six and one-half hundredths of a second) when the cortex is not frozen, because it reacts physiologically and the time is shorter (four and one-half hundredths of a second) when the cortex is frozen because it acts physically. This I consider a very unacceptable interpretation; it is unnecessary to state that the white substance, as well as the cortex, is influenced by the freezing process and the irritability of both endangered and altered.

These cortical destructions and alterations of the

motor centers, are, perhaps, the most important proof the localizers have brought forward, but they are by no means agreed as to the interpretation of experiments supposed to be identical. For instance, Ferrier destroyed the angular gyrus with resulting hemianopsia and so placed the visual center in this region but others have shown that this blindness was temporary. As already explained, others have shown this blindness was but temporary, and then placed this center in the occipital region where the results of destruction seemed more permanent, but no experiment yet performed seems conclusive, for the reason that complete removal of the cortex without destruction of the underlying fibers in the higher animal is not possible, while in simple brained animals even great destruction is well borne with but few motor or sensory symptoms. Here, however, the localizers claim that automatism comes into play and can not therefore be compared with brains markedly convoluted.

Another objection to experiments of this kind is that when the brain cortex is mutilated the animal's disposition is so entirely changed that no just deductions can be drawn by comparing it with a normal animal, with whom at best we can not intelligently communicate.

The true and only test as to the truth of this theory that has so far been applied is the observation of lesions in the human brain. Numberless cases are on record where cortical lesions have resulted in paralyses and disturbances of the special senses. Cortical destruction of the motor region is often followed by paralysis, in the frontal lobe by mental weakness, in the occipital lobe by visual disturbances and in the temporal by deafness. Left-sided paralyses accompanied by aphasia are frequently found to have their origin in lesions near the base of the third frontal convolution. On the other hand, equally well defined lesions impinging on or completely destroying these centers have not resulted in corresponding deficiencies.

The importance of these researches is undoubtedly great, for they have opened up a new and fertile field for the experimenter and have added vastly to our knowledge of the physiology of the brain. On the other hand, they have been a basis for the justifications of the many operations performed for the removal of localized growths or deposits in or on the brain, and as such their accuracy and diagnostic value are rightly questioned. Surgeons have interpreted these researches in a manner that conservative investigators can not approve.

Our medical journals are filled with accounts of operations which have either justified the diagnoses, or where the results were not so bad as to completely confound and condemn both the operator and the operation. Unfortunately the many unsuccessful or otherwise disastrous operations remain unreported as regards tumors, even were the localizers able to absolutely and definitely point the way to the surgeon, yet post-mortems teach us that at least 75 per cent. of such growths could not be successfully removed; and were all the results of such operations known, characterized, as many of them are by mistaken diagnoses and surgical mishaps, 95 per cent. would more nearly represent the proportion of the operations which are either useless or criminal failures. Granting that 5 per cent. of the operations result in improvement or cure, this small proportion does not justify the readiness with which such operations are undertaken. But surgeons have gone further than this. Not content to interfere with pathologic cerebral tissues they have opened brains practically normal, removed the recognized centers and noted results. This has frequently occurred in the so-called Jacksonian epilepsy where consciousness is seldom lost and only one limb or group of muscles is involved. Some of our recent text-books have even gone further and advised exploratory incisions as an aid in diagnosis, as if the trephining of the brain was as simple a procedure as is the opening of the peritoneal cavity, or the results which follow healing as insignificant.

While granting the advance made by experiments on animals in elucidating the physiology of the brain, the modern cerebral surgery based on this is not justified, either by reason of the possibility of accurate diagnosis or the probability that the operation *per se* may benefit. The results of operations even those selected for publication are not encouraging, much less do they lead us to regard the operation as one of minor surgery.

YELLOW FEVER: PATHOLOGY AND TREATMENT.

Prepared for the Pan-American Congress and for the International Congress at Rome.

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I wish in this paper, based on the study of several epidemics of yellow fever in Charleston, to make three points which are of the first importance; also to give some of the results of my experience as regards treatment and pathology, which I do not think have attracted the attention they deserve:

1. That this fever in Charleston has always been accompanied by what is known as "breakbone fever;" this, though extremely mild, is not distinguishable, but being counted in with cases of true yellow fever, prevents all accuracy in the mortality reports,

2. That yellow fever is fully susceptible of successful management in fair cases, seen early,

3. That life is compromised in the first six to ten hours of the disease; so that it is essential that treatment should be begun early.

Co-existence of Yellow and Breakbone Fever.—Invariably two forms of fever existed together, namely, yellow fever, and a milder and more ephemeral, intercurrent species known and designated as "breakbone." Yet this was also not by any means ephemeral, for it often had a duration of several days. Whether they constituted two distinct species, or were only varieties of one and the same malady, has, strange to say, never been decided—no distinct lines of demarkation between the two have ever been satisfactorily established—no physician, however acute, having clearly pointed out any precise diagnostic difference. Though many cried "Eureka," upon more rigid scrutiny the hopes they offered of a solution of the difficulty proved fallacious.

Among the observers there were to be found the lax and the strict constructionists, so that the usual confusion prevailed; *quot homines tot sententiæ*—there were as many opinions as there were persons to utter them. The question was, it must be confessed, surrounded by many difficulties, for while some forms of fever were very mild, and some characterized by black

vomit and suppression of urine were very fatal, others presented every intervening shade of difference between the two; and though the access of what proved to be the simplest cases was sometimes severe and violent, the intensity of the disease was dependent for the most part, I think, upon the amount of climatization enjoyed by the party suffering; and its gravity and its termination, whether favorable or unfavorable, would be modified, it seemed to me by neglect, by delay, or methods of management injurious or beneficial in their effects.

Individually, I am of opinion that, with many who by careful and assiduous attention on the part of the attendants were rescued from falling into a dangerous condition, and who recovered—the result would have been quite the opposite had they been managed otherwise. So that it was the early treatment and the appliances, and the eternal vigilance which sufficed to change the issue, and which did change it; and I hold that such cases, so metamorphosed by the simple, but important difference of management, would have had a very different termination; and would then, even by the most skeptical, have been placed in the category of true yellow fever, which was denied them if they did not get almost or quite into the third stage. The mild cases (breakbone, so-called) may get well with little or no interference. The difficulty was that they could not be surely distinguished at their early inception; and the stranger, in my experience, sometimes had attacks which, when vigorously managed at the beginning, were fully as innocent as those from which natives suffered, and which in these received the designation of breakbone. But in a fever like this which does its work so rapidly, it was at least plausible to believe and to argue that neglect, delay, the avoidance of the proper means and appliances for reducing temperature, etc., would have very much to do with modifying the nature, history, and ending of each case. This need not excite surprise, for did we treat scarlet fever or even measles with agents as active as those we were in the habit of administering in yellow fever, they would inevitably be made quite as fatal.

Pathology.—The peculiar poison when first introduced in the system produces (through nervous paralysis of the capillary arteries, perhaps) intense fever and great excitement of the circulation, with torpor of the glandular and secretory apparatus. It shuts up all the secretions and excretions, and with a high fever which it creates, rapid destructive metamorphosis of the tissues occur, caused by the intense combustion going on; so that spoliative treatment, in the shape of mercurial, saline, or other purgatives, is imperatively demanded at this inceptive stage. These are to be accompanied by revulsives, hot foot baths, and the application of cold to the upper extremities, in order, severally, to empty the intestinal canal and the torpid glandular organs, to diminish temperature, and to contract capillaries. All these means, also, serve incidentally, but powerfully, to lessen the tendency to nausea, and to irritability of the stomach. The latter does not decidedly lead to, or induce black vomit, as is commonly supposed, though the one often accompanies or precedes the other. Both result from the same efficient cause, namely, the altered condition of the blood, induced by the fever. The peculiar vomit is probably owing to what Warren calls "mortified blood," blood thinned by the decomposing action of excessive fever (a quality peculiar to the yellow fever poison alone) transuding into the stomach and blackened by its acids. I could discover by the microscope,[1] frequently used, no distinct difference between this and other bloody matters vomited, which have been acted upon by the gastric juice, as where blood from a cancer is poured into the stomach and afterwards ejected.

The temperature in this peculiar fever, if unsubdued, leads infallibly and of necessity to subsequent trouble, to destructive tissue changes, to blood poisoning, to black vomit, to albuminuria, to coma, or to convulsions. I have seen thorough and persistent sponging with ice-cold water, when combined with the use of the other agencies advised, reduce the temperature, lessen all the bad symptoms in a surprisingly short time; having the power seemingly to change the entire character of the disease and imparting comparative mildness to its whole subsequent career. I will stand to this truth, for in the perception and practical carrying out of it lies the whole virtue of the plea which I advocate and assert to be successful.

In general terms, then, our first efforts must be directed to the relief of the intestinal and glandular torpor which always exist and which is marked by costiveness; we must diminish the cutaneous and general heat, empty the vessels of the system which are laden with impure blood, and obviate the tendency to renal engorgement indicated by the frequent presence of albumen. This is effected by the revulsives, aided by a mild alkalin diuretic, to be referred to subsequently. Then we must strive cautiously at construction, and while allowing the recuperative powers full exercise, we are to do nothing to impair the strength remaining, or weaken the energies of the constitution which have become greatly enfeebled. The unacclimated who are seized with the fever are nearly or quite always in a quasi-critical state, ready at any moment to take the descending path and to become dangerously ill; hence they require as careful handling as children do with scarlet fever. While, therefore, nothing is omitted which will tend to diminish the fever their strength must be carefully husbanded, for the slightest neglect, the failure to keep down the temperature by the application of cold water, or too much medication, though these may seem light transgressions, are powerful and weighty in turning the balance.

Mercurial and antiphlogistic purgatives used at the beginning, serve to diminish the heart's action, to lessen the inflammation by spoliation, by the drain of fluids from the body, augmented by the cooling operation of the salines. All of these are measures only to be employed at the beginning, using the agents in sufficient amounts to effect our object, which is to empty the bowel once thoroughly and effectually, without, as I urged, weakening the patient any more than is absolutely required. Purgatives are on no account to be persevered in. The failure to discontinue them after the efficient action of those used on the first day is procured is, I am sure, a grievous error.

Several authorities commit the fatal mistake of repeating the mercury and cathartics and pushing their use much too far. Even Blair, though in my judgment eminently on the right track, and for this reason very successful, permitted his xx of calomel and xviv

[1] Illustrations of Disease with the Microscope. Prize Essay. Charleston, C. S. A., 1861.

of quinin to be repeated under emergencies, and be used again and again as often as four times; I prescribe it invariably, but never more than once, unless it is not retained or does not act.

In a fever like this, of one paroxysm (but with a remission somewhere between the twelfth and thirty-sixth hour, occurring more distinctly when the proper means are used early,) which is exceedingly violent at the beginning, if unchecked, it does all the violence it is capable of in a very brief period.

I have been the first, I believe, to make a most important declaration; that life is virtually compromised in the first fifteen hours of its career. In such a fever, where the danger and the terrible sequelæ are owing entirely to the extreme intensity of the eremacausis, and the injury worked in the system by the high combustion which acts principally npon the blood, a certain treatment flows logically. There is no time to be lost in setting about it, and it is only to be regretted that our measures can not anticipate the invasion of the attack.

I sincerely believe that thousands of lives could have been, and can be saved by a system of management begun at the very commencement of an attack of the disease, before the fever has had time to produce its direful effects, and by methods simple in their operation, perfectly compatible with reason and common sense, and also based upon a view of the pathology and progress of the disease.

That, consequently, where the demand for medical aid is so urgent, when physicians can not see their cases early—such precious time being lost by their enforced absence—an exception must be made to our usual procedure, and the people in such need must be told what to do before the physician arrives. This is required by the fact, which should be recognized by every one, that death results from the insidious and peculiar fever of the first six to ten hours—whenever this is permitted to go on unchecked—through failure to use these means which are perfectly adequate to restrain and keep down the temperature. So that when a man has been ill for twenty-four hours or forty-eight hours with yellow fever, the attendant is not responsible, and treatment which would have been efficient used early is not to be condemned because it fails at the stage where irremediable organic changes have taken place; and the practitioner who boasts that he has fifty or sixty patients on his list does not know that the last installment (those he can not see for ten to fifteen hours) are, in many instances, already irretrievably doomed.

In fair cases and temperate individuals, treated early, there is no need for any violent third stage, for any black vomit, albuminuria, suppression of the urine, etc.

It is a mistake to suppose that yellow fever is necessarily a fatal malady, that epidemics vary greatly in malignancy, and that we must fold our hands supinely. The truth is that physicians in this city and elsewhere report at the end of the season very few deaths. Belot, of Havana, claims that 95 out 100 fair cases seen early may be cured, and I agree fully with him. I have practiced with success the method to be related in detail (see also *Charleston Medical Journal and Review*, since 1858, and President's address before State Medical Association of South Carolina, 1872). Dr. C. W. Horsey adopted the treatment in the fever of Fernandina, Fla., 1878, others have employed it successfully, and Surgeon Sternberg refers to it approvingly in his elaborate and able article in Wood's Hand-Book of the Medical Sciences. I had long shown by the adoption of Blair's system, materially modified, the application also of cold water was the foundation fact in the treatment. In confirmation of this, Prof. T. O. Summers, of Nashville, says: "Cold water is the remedy in yellow fever." (Paper on treatment of yellow fever in 1879).

Treatment.—The treatment consists: 1, in sponging assiduously the head, hands and arms with ice-cold water at the very commencement of the attack, not losing an hour, and repeating this at intervals whenever the temperature rises, ice-water being quite capable of reducing the temperature. Towels soaked in the ice-water are preferable to sponging; fifteen to twenty minutes generally suffice for each application, its necessity being determined by the existence of pyrexia. Few perform this simple but essential procedure as efficiently as they should do; 2, give immediately Blair's "calomel, grains xx; quinin, grains xxv" (in proportion to ages), and but once. I have never seen the quinin produce a single ill effect, though given when the fever is intense; 3, follow in three or four hours with a saline cathartic (sulphate of magnesia), which is cooling and antiphlogistic; 4, apply mustard plasters to the entire abdomen, and use hot mustard pediluvia from the beginning of the attack, and repeat them frequently. These may be followed by a cantharides plaster upon the abdomen—which certainly does no injury. After the saline has acted, give an effervescent or antacid mixture of this nature (which also had the support of the late Prof. E. Geddings): Potas. acetate, 1 dram ad 2 drams; potas. citrate, 1 dram; morphia, 1 grain; water, 6 ounces. A dessert-spoonful every two or three hours. Used to quiet gastric irritation and to act slightly as a mild antacid and diuretic.

No other treatment or active medication are required, save the continuance of the cold application and pellets of ice given internally if necessary. Doubtless a few drops of tincture of aconite added to the mixture, or given separately, might prove serviceable.

By this method those recover, according to my experience, carefully recorded, who are seen early: who possess their organs in a state of integrity; with the intestinal canal, liver, kidneys, and other emunctories in a fair condition. This surely is not asking too much; and to claim that recovery will almost invariably ensue in such cases, under the plans detailed elsewhere, and on this occasion, is, if I am correct, making what I can not but regard as a true and important advance. This I hope and believe will one day be fully acknowledged. It is spoken seriously and earnestly without lightly coming to the conclusions, and I sincerely trust that the expression of them will not be regarded as presumptuous or premature.

How different is this from a former system of mercurial purgatives repeated every five or six hours, or a constant effort to induce ptyalism by giving mercury with opium at any and every stage of the disease—with the omission of other measures insisted on here as of the first importance. Persons seized with such a fever, who are seen for ten or twenty hours, those who already suffer from organic lesions,

whether of the stomach, liver, or kidneys, whose digestive organs (so essential to the nutrition, growth, and repair of the system) are irritated and inflamed by the use of intoxicating drinks, can not be expected to respond to any treatment, however judicious and appropriate.[2] In such subjects there is great tendency to irritability of stomach; the purgatives are not retained, the inflammatory stage (fever) runs high, and can not be subdued. Congestion of the internal organs, kidneys, etc., with albuminuria, occurs; black vomit sets in; and uremic poisoning, with coma, generally closes the scene—during attacks of violent convulsions. Under such conditions, all agents prove nugatory; every effort is necessarily unavailing; and these cases—falsely and illogically reasoned from—bring reproach upon true and legitimate treatment, which can be shown to be serviceable in those who, from the beginning, are not plainly beyond the reach of art.

In my humble judgment, if not the height of folly, it is at least extremely unfair to decry or, which is worse, to abandon, a course of management which is eminently and strikingly successful in nearly or quite all the cases of the class previously described, because it fails to cure those who have no right to expect a miracle to be worked in their behalf.

Any treatment which is successful is not so by accident, but because it is based upon the requirements and real nature of the disease and throughout does the patient no harm. It is high time for the intelligent members of our profession, particularly if they be at all apathetic, to give up the pleasing idea that the practice of physics is all guesswork, in which one artist does full as well as another; that fate and the disease have the control, and that always when a child or man dies the "physician who heals is Death."

THE CAISSON EXPLOSION OF BATTERY F, SECOND REGIMENT OF THE U. S. LIGHT ARTILLERY.

BY EDMUND ANDREWS, A.M., M.D., LL.D.

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The writer is at present in charge of a number of soldiers wounded by an accident so rare, that hardly any officer in the United States service has seen an example of it.

The singular character of the wounds produced, and the rarity of the causes producing them, render the cases most instructive for study.

The late riots in Chicago, by obstructing the United States mails, and arresting commerce on interstate railways obliged the general government to send to Chicago about 2,000 regular troops to maintain order.

On the 16th of July, Battery F of the Second Regiment of U. S. Light Artillery was moving at a trot on Grand Boulevard, supported by a company of the Seventh Regular Cavalry, when suddenly the three ammunition chests of the first caisson exploded with terrific violence.

The caisson was drawn by four horses, which were guided by two mounted drivers. Two cannoneers sat on the limber, or forward chest, but fortunately there were no soldiers on the two others. Two sergeants were riding beside the column, and also part of the cavalry escort. A number of citizens were on the sidewalks, and at the doors and windows of the adjacent houses.

The two cannoneers on the limber were literally blown to pieces and the fragments scattered hundreds of feet. Two of the mounted men were also killed, and fifteen men were wounded. Three citizens received injuries. Nine horses were killed.

The singular character of the wounds will be noted below.

There were 126 cartridges of cannon powder in the chests amounting to over 400 pounds, besides a large number of shrapnel, and other loaded shells.

The subjoined cuts, and some of the facts about the nature of the shells, etc., are from an article furnished to the Chicago *Tribune* by an educated military officer.

There were two kinds of projectiles in the caisson; one, the simple steel shell with a time fuse. These were all picked up afterwards unexploded. The other kind were the complicated shrapnels which have percussion as well as time fuses, and exploded all about wherever they struck the ground. The shrapnel shell is named from its inventor, Gen. Shrapnel. Fig. 1 shows a longitudinal section of one.

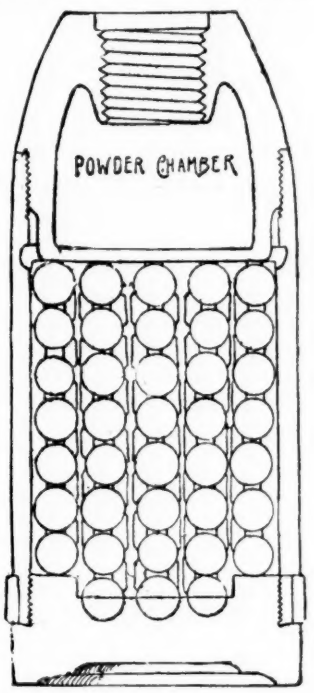

Fig. 1.—Longitudinal section of shrapnel.

The top of the shell is closed by a metallic plug screwed in and containing a complicated arrangement for firing the powder in the shell, whenever it strikes, or sooner if desired. Below the plug is a chamber filled with a small charge of powder—two and three-fourths ounces—just enough to burst the shell as it flies toward the enemy, while the pieces spread out in the form of a cone and continue on their course, making awful destruction. Below the powder chamber there is a larger cavity containing 162 lead bullets mixed with rings of cast iron. The bullets, added to broken rings and fragments of shell make for each shell over 300 pieces of metal to be shot fiercely into the faces of the enemy.

Experiments made to determine the effect on a target showed that the flying pieces pierced the wood

[2] "There is no hope for the drunkard."—S. H. Dickson.

so closely that there was hardly a spot as big as two hands which had not been struck. It is one of the most terrific instruments of war.

Fig. 2 is a transverse section of the bullet chamber.

Fig. 3 shows the cast-iron rings for holding the bullets steady.

It will be observed that in shrapnel the bursting charge is small, so that when a stationary shell explodes, the pieces do not fly laterally with great velocity. The terrible effects in war are caused by the forward velocity given by firing the shell from the cannon. In the present case the shells were not fired from the gun and hence though fifty-three of them exploded, few of the wounds contained any bullets or pieces of iron.

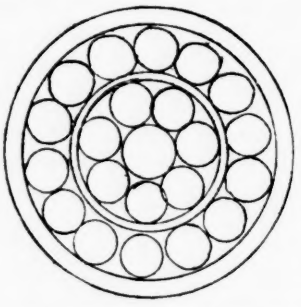

Fig. 2.—Transverse section showing the arrangement of balls.

The remarkable feature in the injuries placed under my care is that nineteen-twentieths of the wounds were made by the big unconsumed grains of modern cannon powder which are nearly half an inch in diameter and penetrate like bullets. Those who were most severely injured were under too much shock to bear transportation to the distant camp, hence five were brought to me in Mercy Hospital, and one to Prof. E. W. Andrews at Michael Reese Hospital.

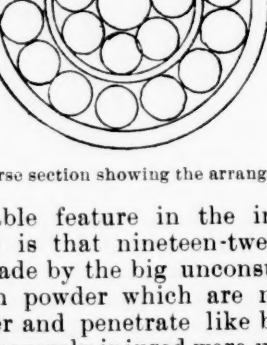

Fig. 3.—Cast-iron rings.

The latter soldier, Private Stoltz, sat on his horse in front of the exploding limber chest, receiving the projectiles in his back. The grains of cannon powder in the chest were large and irregular in form, averaging about the size of chestnuts. Thousands of them flew in every direction like bullets, some burning as they flew, and many probably not even on fire. Aside from the flying pieces of powder, a great globe of flame enveloped the whole area near the caisson. Stoltz's hands and the back of his neck were blistered by the flame. The parts covered by clothing escaped blistering but his entire back down to the line where the posterior elevation of the saddle-tree protected the nates, was perforated by hundreds of cannon powder masses, so that there was hardly room to touch him with the point of a finger without inserting it into one of the orifices. Generally the wounds penetrated about three-quarters of an inch and the surfaces were black and pulpy as if the connective tissue were half crushed and half burned. The grains themselves could not be found in definite form, either having been burned up in their beds, or else been softened by the blood into a paste. Some of the larger wounds contained broken chips of wood from the limber chest. One large piece of wood five inches long and an inch wide had pierced the skin endwise and lay along the seventh rib. No bullets nor pieces of iron were found, but some of the wounds were deep, and bullets or pieces of iron may have been in the interior depths. As he was in a dying condition thorough search was impossible. The patient was delirious and died in six hours of shock.

Sergeant L. Leiner was brought to Mercy Hospital suffering severe shock so that great fears were felt that he would not rally. However, in twenty-four hours he had pretty well reacted. At the time of the accident he was riding beside the column a little to the rear of the exploding caisson, so that he received the blast in front. His face and hands were blistered by the flame, the whole front of the body, from head to ankle was punctured with powder lumps similar to those of Stoltz, but fewer in number. Perhaps a hundred in all. One of the wounds penetrated through the rectus abdominis muscle, so that the finger could be inserted, but the peritoneum was not penetrated. Pieces of wood were extracted from that wound and from several others, but most of the orifices contained nothing tangible. One wound over the ligamentum patellæ allowed the finger to run up into the patellar bursa and the front of the bone was chipped. A piece of iron about half an inch long lay there, but the capsule of the joint was not opened. He is now out of bed.

Private O'Donnell received the charge also in front, and had perhaps a hundred powder punctures. The shock was severe. The face and hands were blistered. One wound of some size was received on the eyebrow and others in various parts of the face and body. Several pieces of wood from the ammunition chests were extracted, and also a piece of copper, derived from the copper ring that encompasses the base of each shrapnel shell.

Trumpeter H. Antes, Seventh Cavalry, received numerous wounds over the front of the face and body, one of them chipping the end of the clavicle. Pieces of wood were found but no metal, yet he had apparently been struck by a large fragment of iron or wood, for the right deltoid muscle was torn away, the acromion process was shattered, the tuberosity of the humerus was carried away bodily and the shoulder-joint was laid open along its outer border. Several small pieces of wood and chips of bone were removed, but no metal. The wound extended behind the scapula below the spinous process. It was cleansed and dressed antiseptically. In a few days he was removed to Fort Sheridan, where Surgeon-Major Girard exerted himself to get rid of all septic remnants of bruised flesh and crushed bone and then trimmed the flaps and brought up the remnant of the deltoid and sutured the flaps together, thus covering the wound and the opening of the joint, with an excellent prospect of saving the articulation from suppuration and ankylosis.

The wounds of the other soldiers were similar in character.

One lady in an adjacent house had her arm cut, probably by flying pieces of glass.

Another lady received a projectile from a shrapnel cutting off the tendon of Achilles.

A boy of 14 years passing on a bicycle, received two shrapnel shots in the calf of the leg.

So far as I had opportunity to observe, none of these men received any injury to the globe of the eye, though their faces were perfectly peppered with wounds. This seems to show that the explosion was not absolutely instantaneous, since they had time to shut the lids before receiving the blast.

As to the rarity of this accident, it is well known that ammunition chests are occasionally exploded in battle when struck by the shells of the enemy, but to do so when simply traversing a smooth road is so unprecedented that only four cases are on record in the U. S. Army, and in only two of them are the facts clearly established. The investigations already ordered will doubtless discover the causes, and prevent such disasters in future.

2520 Prairie Avenue, Chicago.

TWO CASES OF INTESTINAL OBSTRUCTION.

Specimen presented and remarks made at a meeting of the Medical Society of the District of Columbia.

BY I. S. STONE, M.D.

SURGEON TO COLUMBIA HOSPITAL, ETC., WASHINGTON, D. C.

Case I.—R., colored, age 21, had been sick three weeks with specific pelvic suppuration. She had no symptoms of intestinal obstruction or of nephritis. She had the usual preliminary treatment incidental to laparotomy for pyosalpinx. Salts were administered freely and acted well the day before operation. Her urine was examined on entering the hospital and again the day of operation and pronounced free from albumen. A microscopic examination was not made. The operation was made on June 6 at 10:30 A.M. Everything passed off in a satisfactory manner. Intestinal adhesions were not difficult to overcome. The patient was placed in the Trendelenburg posture and every precaution was taken to complete the operation in a thorough and satisfactory manner. The pelvis and lower abdomen was flushed with rather more than the usual care, as quite a large quantity of pus had escaped in the removal of the greatly distended pus sacs. A glass drain tube was placed as usual. Nothing unusual occurred after the operation until the next morning when the transverse colon was found distended greatly. The administration of enemas had but little effect in dislodging the collection of gas, and the stomach refused at first to retain fluids. Afterwards during the afternoon and evening of the day following operation, salts and castor oil were both retained in full quantity without overcoming the fatal obstruction. The patient did not suffer greatly from pain. There were few symptoms of peritonitis and, in fact, the prompt occurrence of the symptoms after operation did not suggest peritonitis as a cause of the distension. The drainage tube was removed in thirty hours and a long forceps with a piece of gauze was used in the drain tract to ascertain if the intestines were anywhere adherent. The forceps moved freely and easily, thus demonstrating the absence of pelvic peritonitis. At the autopsy this was proved correct, as there was only one point where the intestine was adherent, namely, to the pedicle on the right side.

The quantity of urine passed was estimated by the house physician at eight and one-half ounces during the forty hours the patient survived the operation. This decrease in the quantity of urine was thought due to the obstruction, and the kidneys were not thought diseased. Ether was used as the anesthetic but only a small quantity was required, as the patient very rapidly came under its influence.

The operation was not more difficult than usual, and was done with deliberation and care in every detail in less than forty-five minutes. The patient died forty hours after operation. The autopsy six hours later revealed two points where the intestine was occluded. One specimen shows the large bowel at junction of the transverse and descending colon just under the spleen. A stenosis exists at this point. Air could easily be forced through this narrow passage before the specimen was laid open by the pathologist. When the autopsy was made I thought this stricture might be due to change in the intestinal wall after the operation, or due to intestinal spasm. But the section plainly shows an organic stricture permeable during life when intestinal peristalsis was not diminished. But this was not the only source of obstruction. A diverticulum was found tightly drawn across the ileum about three inches above the cecum. The greatly distended ascending colon appeared to press the lower end of the small bowel forward and thus added to the twist of this diverticulum, which completely occluded the bowel at this point. The small intestine was distended with fluid and intestinal gas to this point. This diverticulum is two inches long, three-fourths of an inch wide at its central portion and gradually narrowing toward each end. It appears to be a congenital abnormality and much resembles an abortive mesentery or mesenteric fold.

The theory of the case is somewhat as follows: After the operation very little flatus was forced through the lower stricture even with the aid of enemata. The transverse colon soon became distended causing pressure upon the stomach and displaced the diaphragm with heart upwards. Rapid and feeble heart action supervened and the patient had the appearance of secondary shock. The obstruction near the cecum did not permit the entrance of fluids into the large bowel, and in consequence the narrow structure of the colon would not yield to the feeble peristalsis of the distended bowel.

Still another element of unseen danger entered into the combination which produced the fatal result. The quantity of urine was greatly diminished, and as above stated this was thought due to obstruction high up in the small intestine. At the autopsy, the explanation was found in the kidneys. Both kidneys present undoubted evidence of nephritis. This fact affords another instance of the very unreliable nature of our usual tests for this disease prior to surgical operations, and especially in view of the influence of ether upon the kidneys. The examination of the patient's urine was made upon two occasions by internes in whom I have perfect confidence as to integrity and capability. No albumen was found. Finally there would appear but slight probability that the nephritis in this case could be of only forty hours duration, or in other words be entirely due to the use of ether.

WASHINGTON, D. C., July 10, 1894.

DR. I. S. STONE, 1504 H Street, N. W., Washington, D. C.:

Dear Doctor:—The specimens in the case of the colored girl, Ragland, consisting of the large intestine and kidneys, have been subjected to a microscopic examination in the laboratory of the Museum with the following results: The stricture at the junction of the transverse and descending colon shows, on section, marked thickening of the longitudinal and circular muscular coats of the bowel, as well as increase of the submucous layer. The mucous membrane lining the stricture was somewhat atrophied. From this examination I am led to believe that the stricture was organic in its nature, and probably congenital in origin. The kidneys show an advanced degree of fatty degeneration of the epithelium lining the secreting tubules, as well as that lining Bowman's capsules and covering the Mal-

pighian tufts. There is also a perceptible increase of connective tissue throughout the kidneys.

Very respectfully, WALKER REEDE,
Maj. and Surg. U. S. Army, Curator Army Med. Museum.

The next case of obstruction was one of great interest although the cause was entirely different, being due to the presence of a dermoid cyst of the ovary with a twisted pedicle:

Mrs. P. had been taken ill on June 6 with severe abdominal pain, nausea and vomiting. The use of enemata failed to afford any relief, after several days of vigorous efforts on the part of her physicians, Drs. Harding and C. W. Brown of this city. I was called in on June 10 to see if operative measures might afford relief. A tumor was found filling the pelvis nearly to the umbilicus and appeared to be more upon the left side. The very great distension of the abdomen made a careful examination difficult but sufficient was learned to justify prompt abdominal section which was done an hour later. A very dark sac of an ovarian tumor was found and removed. Four twists of the pedicle caused the almost gangrenous condition of the cyst. Light adhesions of intestines to the sac, and also some adhesion to the parietes and sac were soon disposed of, the abdomen flushed and closed without drainage. Including the time of giving the anesthetic until the abdomen was closed occupied about thirty minutes. The patient's condition before operation was very precarious and caused her physicians great uneasiness. Under morphia and heart stimulants she bore the operation very well and rallied from shock in a very satisfactory manner. Her bowels discharged great quantities of gas the morning after the operation and the recovery has been uninterrupted and without incident.

SOME UNUSUAL EFFECTS OF QUININ ON THE SKIN.

BY J. SCHNECK, M.D.
MT. CARMEL, ILL.

Perhaps the most common dermal effect of quinin, when administered internally, is a form of hives or urticaria in which the surface is fairly covered with irregular shaped reddish colored blotches, varying in size from that of a dime to the palm of the hand. The skin is slightly elevated, has a hard, tense feel to the touch; there is usually intolerable itching and burning; sometimes the skin is so sensitive that even the slightest touch causes severe pain and feels as if a raw surface had been touched.

In other cases the eruption is in the form of a rash, similar to that seen in scarlet fever. Often there is a uniform flush of the surface of the skin as in an erythema. Quite frequently a herpetic eruption follows the administration of quinin, which may be located on the lips, ear, cheek or prepuce. I have a lady patient in whom a 5 grain dose will produce an acute coryza.

There is a rarer form in which a small circumscribed area is affected whenever quinin is administered. I have treated an old lady for years in whom 10 grains of quinin, given during one-half a day, will cause large reddish-purple blotches to appear on the ulnar margin of the left hand, and another, about the size of a half dollar, on the upper portion of the left concha; the eruption is accompanied by a hot tingling sensation and disappears during the following twenty-four hours after the remedy has been given; the same train of symptoms invariably occur when she takes quinin.

Another case is that of a carpenter in whom a course of 20 grains of quinin, given in 4 grain doses two hours apart invariably produces a similarly colored condition of the skin, on the back of the left thumb, between the first and second joints. The burning sensation is very severe, the epidermis is raised into a blister and afterward shed.

A still more singular case is that of a young farmer in whom 20 grains of quinin will cause the mucous membrane covering the glans penis to change to a dark purple color, accompanied by intense itching, followed by the shedding of the epithelial layer in the course of the following week.

Another instance is that of an intimate friend in whom 4 grains of quinin will cause a most annoying itching of the glans penis in from thirty to sixty minutes after it has been taken. If taken at bed-time the itching will continue until morning. The party is about 50 years old, and during the last eight or ten years of his life this effect has invariably followed the use of quinin, while previous to that time this effect was not noticed, although he has taken quinin frequently since early childhood. This last instance is of especial interest as it indicates the length of time required from the ingestion of an ordinary dose of quinin until its physiologic effects are produced.

In the lower forms of animal life the sloughing of the skin is a common and useful function. May not the shedding of the cuticle which we see in many skin diseases and the similar effect of some drugs on the epidermis find a rational explanation in this primitive function? In either case it is an angio-neurotic process, which is either circumscribed or general in its manifestations. May they not both be forms of erythema, which are easily induced, from the presence in the skin of hereditary peculiarities? It can make no difference whether we adopt the theory of Lamark; that man has been evolved from the lower forms of life by the ever present law of heredity; or that of Darwin, that man is the highest resultant of the law of the survival of the fittest in the struggle for existence in the ever changing environments on the earth; or to the more modern doctrine of Weismann, that these changes are due to an innate energy in the germ-plasm which tend continually to the production of higher forms of life and to the adoption of better and more complex organs and organisms. In either case we find ourselves so very closely related in the physiologic functions to the lower forms of life that one naturally concludes that the ease with which the epidermis is raised and shed in man, may be due to the reappearance of a former condition.

What it is to be One's Physician.—To be one's physician, the Supreme Court of Arizona holds, in the case of the Mutual Life Insurance Company of New York v. Arhelger, decided March 8, 1894, means to attend upon him or consult with him in a professional capacity about his state of health; that is to say, to prescribe treatment, if necessary, and give directions and advice calculated to relieve from sickness and restore to health. This definition has an important practical application, because it is usual for life insurance companies to include among the subjects to be covered by the medical examination inquiries with regard to when the applicant for insurance consulted or employed a physician. In this case, where the applicant was asked when he last consulted a physician, to which he answered, "Not since childhood," and warranted his answer to be true, the Court holds that if he consulted any physician in a professional character, or received any treatment or advice at the hands of one, it was his bounden duty to disclose the fact in answer to the inquiries, and if he failed to do so his warranty was thereby broken.

THE
Journal of the American Medical Association
PUBLISHED WEEKLY.

SUBSCRIPTION PRICE, INCLUDING POSTAGE:
PER ANNUM, IN ADVANCE $5.00
SINGLE COPIES. . . . . 10 CENTS.
Subscriptions may begin at any time and be sent to
THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION,
No. 68 WABASH AVE., CHICAGO, ILLINOIS.
W. H. LOWDERMILK & CO., WASHINGTON AGENT.

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SATURDAY, AUGUST 4, 1894.

THE PRESENT STATUS OF MEDICAL EDUCATION IN THE UNITED STATES.

A rapid evolution in medical education is apparent in this country. Not content with the extension of requirements for the degree of M.D. from two to three courses of lectures, there is most convincing evidence in the events of the last few weeks that point to the immediate adoption of the four course requirement by every reputable medical college in the country. The action of the College Association in adopting the four years' course with attendance upon four courses of lectures goes into operation in 1895. All the colleges in Chicago, Harvard University, University of Pennsylvania, College of Physicians and Surgeons New York, Jefferson Medical College, University of Michigan, University of Minnesota, and many others have already adopted the four-term requirement. The indications point to definite action in the adoption of the four-year course at once by all the colleges in Ohio, Missouri, Iowa, and by a limited number of the Southern schools. The extension of the courses of medical instruction will reduce the number of students somewhat, but not enough to affect the income of the colleges. Experience has shown that in the last few years colleges extending their courses have had increased attendance and largely increased incomes. The increase from laboratory fees has been particularly noticeable. With the four-year requirement in practical operation in this country we shall hear less regarding the poor quality of medical education. The appointment of a committee in the College Association on minimum of professional study and to prepare a curriculum of study for each branch to be taught in the proposed four years' course was most wise. This Committee consists of PROFS. CONNOR, of Ohio; VAUGHN, of Michigan; QUINE and DAVIS, of Illinois; STEMEN, of Indiana; and MILLARD, of Minnesota, all of them teachers of experience.

There has been a noticeable lack in uniformity of grade and entire lack of uniformity in methods. The amount of work upon each branch has been greatly governed by the views or wishes of the individual instructors. In one college the student would be offered a thorough course of instruction in hygiene; in another no instruction whatever. In the division of work under the four years' curriculum our colleges will follow in the footsteps of foreign schools. The work will be divided into the scientific and clinical departments; the scientific work being largely embraced in the first two years. In the first two years of the course we trust that didactic methods will rapidly give way to recitation work, and in the last two years bedside instruction will greatly displace the old method of massing the students into an amphitheater for a general clinique.

We trust the Committee will go to the bottom of this all important subject, and that at next year's meeting the Association will scan their labors most thoroughly. We hope also that the Committee will give the study of pathology and therapeutics a prominence in the work of the last two years, that their importance merits. Systematic laboratory and classroom work should be provided for in pathology during the last two years. The course in therapeutics can not be too thorough. In short, the entire work of the four years' course should be greatly confined to the so-called fundamental branches, with the elements of the special branches, reserving thorough courses—the specialties—to post-graduate schools or the so-called "special courses" approved by the undergraduate colleges.

NARCOMANIA.

Experts and noted writers agree that this term describes more accurately the condition of many inebriates, than dipsomania. The latter indicates a thirst mania, which is very rarely seen, and of short duration, while narcomania is a mania for relief, or the intense desire for the anesthetic effects of alcohol, opium or any drug which will quiet the physical or psychical sufferings of the organism, and is common to most cases of alcoholism. An inebriate who has become powerless to control this alcoholic impulse, and who gives way to it continuously, or at intervals, is a diseased man requiring medical recognition and care.

Such men are what may be termed defectives, and in most cases are of bad judgment, weak, erratic, changeable feelings and morbid enthusiasts. Recently the prominence which a few men of this class have taken in the affairs of the country, bring up the question of their mental condition, and suggest a new study and change in public sentiment. A practical illustration is that of a business man, at

the head of a large industry, who drinks to great excess at intervals, and whose bad judgment and insane-like reasoning has on several occasions caused great suffering to those whom he employs, and the community in which he lives. Lower down, a man who drinks at intervals has attacks of delusional mania and causes distress and suffering to those about him; or commits crime which perils the interests of the community.

Another class growing more prominent, are so-called reformed inebriates, who after years of excessive use of spirits, seemingly stop drinking, and become wild agitators, and sensational leaders of impractical theories. They call themselves pioneers, socialists, and are active to change and disquiet the existing order of events. They are prominent in all new schemes for money, power and popularity; and after an uncertain period relapse, and become wilder and more irregular. They are becoming prominent in every community, as supporters or opponents of every possible good or bad theory, quackery, delusion, socialism, anarchism, and are so-called reformers of every degree. As advocates of "gold cures," they have tried the treatment and then enter upon the business of curing others. Becoming officers of branch cures, they urge the most extravagant expectations in pecuniary returns, and possibilities of curing others. Later the institution is bankrupt, and they relapse and disappear. The head centers who provide the secret remedies, wisely receive all pay in advance, and never trust, while the credulous stockholders and supporters of these branch cures, trust to the pretensions of these reformed officers.

Many of the extreme reformers, who create a large following for a time, then disappear under a cloud, are of this class of narcomaniacs. Sometimes in medical circles these cases appear, urging some very startling innovations in remedies and treatment, or claiming some discoveries which threaten to change all existing order of events. Not unfrequently they pose as enthusiastic advocates of some half way proprietary medicines.

The general public overlook the fact that such cases are "border briers," and not unfrequently pass over into the realm of insanity, both acting and reasoning like insane men. In the interval they may pass unobserved in many circles, and be credited as of sound mind. But when they commit crime and become objects of study, a new chain of symptoms appear, pointing out states of degeneration not noticed before. Physicians should enter upon this neglected field of psychical and obscure mental symptoms, and be able to make diagnoses of cases, that are seldom recognized until they fall into the hands of specialists. Narcomania is only one of many of these obscure degenerative mental disorders, which may go so far, then stop, or continue to some pronounced phase of insanity. An early diagnosis of a paranoiac and defective brain, and appropriate care and advice, would save most disastrous consequences later. So-called habits, conduct and methods of reasoning, should be the subjects of medical study as much as the heart's action, the temperature and reflex of the body.

The narcomaniac is diseased and requires medical care and treatment, and the general practitioner is in a position to study and understand these cases more clearly than the specialists.

THE REDUCTION OF THE ARMY MEDICAL DEPARTMENT.

Congress has cut down the Medical Department of the Army. If a bill had been introduced for this special purpose and the arguments for and against its passage had been heard, we take it for granted that our Federal legislators would not have crippled the Department. The blow was dealt by a proviso to that part of the Army appropriation bill which provides for the 1894-95 expenses of the Medical Corps. This proviso, which reduced the number of Assistant Surgeons from 125 to 90, was on the bill when it was reported to the House of Representatives by the Military Committee, MR. OUTHWAITE of Ohio, chairman. Although we now know why the committee made this attack upon our medical *confrères*, it was at the time a great surprise, for we were under the impression that the Medical Corps was in good repute and deservedly so, at the Capitol Building. The energy and ability of the Surgeon-General had just created an Army Medical School out of nothing, or which is the same thing, out of materials which although ready at command had not up to this time been utilized. Its first session had closed and the value of its work was fully recognized. An Examining Board had been ordered and over fifty candidates invited to compete for the six vacancies then existing, when this proposition of the Military Committee became known. To the disappointment of the candidates the order convening the Board was revoked and the examinations postponed indefinitely, depending on the action taken by Congress. The Surgeon-General would have been warranted in filling the vacancies under the existing law, but he evidently preferred to manifest his readiness to obey, in a military way, the spirit of legislative control.

It was only after the bill had been reported to the House of Representatives that this proviso became generally known to those interested in the welfare of the Department. One of MR. OUTHWAITE'S arguments in favor of the reduction was that no protest against the proposed action had been made by the medical profession. The ASSOCIATION telegraphed from San Francisco, California, sustaining the Corps and commending it to Congress, but this, with similar

action by state and local medical societies was too late to influence the action of the House of Representatives already taken. The Senate expressed its views by rubbing out the proviso, but when the bill came to conference a compromise was adopted, reducing the number of Assistant Surgeons from 125 to 110.

There can be now no appointments in the Medical Department of the Army until this reduction has been effected. But for this there would have been ten vacancies to be filled now; six more places must therefore be vacated before an appointment is made. Under the law, examinations may be made at any time, passed candidates being held for appointment to such vacancies as may occur within two years after their successful examination. The Surgeon-General will no doubt issue a circular of information on this subject to those concerned.

This reduction necessarily postpones the second session of the Army Medical School so far as passed candidates for the Medical Department are concerned, and delays experience in its management and work; but no doubt each member of the faculty will keep his course in view and make use in perfecting it, of the time and experience already gained. This School of Sanitary Science and Preventive Medicine as applied in the Army should not be permitted to lapse.

Moreover, an effort should be made to have Congress re-consider this ill-advised legislation. The Army needs its full complement of specially trained sanitary officers. On them we rely for the protection of our camps in time of war, for the organization of our field and general hospitals and the induction into each newly formed organization of that *esprit du corps* needful to its successful operation. It is difficult to see how the Medical Corps can accomplish its work, deprived of 8 per cent. of its young men. Medical officers sometimes break down under sickness, and all are entitled under the laws to a certain allowance of leave of absence, which each can only get when there is a spare officer for his relief. Many large posts have only one surgeon on duty, and troops are frequently ordered out from such posts without a medical officer. Instead of reducing the Corps there should be enough of spare officers at the command of the Surgeon-General and his medical directors to have qualified medical attendance with every squadron patrolling the Mexican frontier, and with every detachment subject to the dangers of field service.

We trust that this action may be reversed at the next session of Congress.

DENGUE AND YELLOW FEVER.

An epidemic of dengue is reported in the U. S. military barracks at Key West, Fla. Dr. Joseph Y. Porter, State Health Officer of Florida, says that there had been, up to the 18th ult., 75 cases out of the garrison of 115, and that "this epidemic has been characterized by some phases not described usually in the text-books and has been an interesting study." In his report (*Abstract of Sanitary Reports*, July 27, 1894), Dr. Porter does not specify the features which constitute the unusual phases of the epidemic nor the characteristics which make it an interesting study. From the report of G. B. Young, Passed Assistant Surgeon, M. H. S. (*loc. cit.*), it appears probable, however, that the features of interest consist in some abnormalities of the pathognomonic relations of pulse and temperature; he says: "There has been a marked disproportion between the pulse and temperature in about all the cases; the temperature has not been high; I noted, however, two cases especially interesting—in one the temperature was 104 degrees, pulse 85; in the other, temperature 103.4 degrees, pulse 78." In dengue the pulse usually increases in frequency as the temperature rises, until the maximum is attained, and then falls, *pari passu*, as the fever declines—unlike yellow fever in which the pulse generally falls on the third day while the temperature continues to increase.

This "epidemic" derives whatever of practical importance it may possess from its value as an illustration of the great gain to the material interests of the country which accrues from increased knowledge and more exact diagnosis of the so-called quarantinable diseases. Within a very few years this occurrence, coupled with recent arrivals of yellow-fever infected vessels, might have caused a panic throughout the South Atlantic and Gulf States, and the enforcement of the unscientific, illogical and even barbarous quarantine restrictions of the period resulting in untold injury to commercial interests and values.

Prior to the introduction of the clinical thermometer, dengue was looked upon by many physicians as a mild form of yellow fever, a view which gained color from some of its symptoms, but especially from its tropical habitat, the influence of locality and its association with certain seasonal influences—all in common with yellow fever. For example: A continued high temperature being an essential condition of its epidemic prevalence, and this being put an end to on the first appearance of frost; its limitation, for the most part, to towns, and of these, to the filthy, low-lying quarters of seaports; its intense foci being in the 'tween decks of ships and in the crowded centers of squalid population, etc.

Epidemiologists are now agreed that epidemics of dengue figure to an undue extent in the "tabular statements" of yellow-fever epidemics, in the history of this latter disease prior to 1860, and are disposed to consider many of the reported cases of recurrent attacks of yellow fever in the same individual as mistakes in diagnosis. There is now, however, little

danger that the appearance of dengue shall be mistaken for that of yellow fever, and so throw a group of States into a paroxysm of unreasoning terror and the establishment of "shot-gun quarantines," as happened so lately as 1880, in Tennessee, Arkansas, Mississippi and Louisiana on the occasion of the passage of the towboat *Raven* and its barges up the Mississippi River with cases of this disease on board.

The lessons of dengue at Key West in 1894 are that advances in medical science are the only reasonable foundation for the modification of quarantine restrictions affecting travel and traffic—the bases of commercial prosperity; that one of the best investments for the Nation would be the necessary appropriation and adequate legislation for the promotion and utilization of such advances; and that a Department of Public Health operating through existing Bureaus, is the logical and ultimate agency through which to give potency and effect to these advances in preventive medicine.

VITAL STATISTICS.

A correspondent (DR. S. B. GRIFFIN, of Stockton Springs, Me.) asks the JOURNAL to furnish him "the statistics for 1890, or later, of the mortality of each State in the Union and, especially, the number of deaths from consumption in each thousand deaths in each State."

As the JOURNAL is in frequent receipt of similar queries from its subscribers—and which have hitherto been answered individually from the best sources of information at hand—it seems well to say that there are no trustworthy vital statistics for "each State in the Union." The only authoritative compilation of such data is that of the decennial census of the United States, and this covers—for such purposes as these inquirers have in mind—only those States and cities which have in force some legally authorized system of registration of deaths and causes of deaths.

In the following summary, which is of interest to the general reader sufficient to warrant its presentation in this form, will be found such authentic information of this character as is at present available. It covers only those States which enforce a registration of deaths and causes, to-wit: Alabama, Connecticut, Delaware, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont, and the District of Columbia. In addition to these, the census embraces also the vital statistics of some thirty-six "registration" cities, for the details of which reference must be made direct to the census reports.

In the States above enumerated, and in the District, the total deaths during the census year were 427,538, which, in a population of 21,093,320, gave a rate of 20.27 per thousand. In the States in which no registration system was in force with a population of 41,528,930, the death rate, as computed from the enumerators' returns, was only 10.79 per thousand—a figure obviously unworthy of any serious consideration.

As to deaths from consumption in these registration States and in the District the following are the figures per thousand of all deaths: District of Columbia, 139.16; Delaware, 158.98; Massachusetts, 134.28; Rhode Island, 124.17; Alabama, 115.55; Vermont, 125.76; New York, 121.44; Connecticut, 121.36; New Jersey, 112.33; New Hampshire, 106.24. The total deaths in this group from this cause were 31,743, which, with the population above given, would make an average death rate from consumption of 1.50 per thousand.

On the other hand, the enumerators' returns for the non-registration States, show 70,456 deaths from consumption in a population of over 41,000,000—a death rate from this disease of 1.69 per thousand, or largely in excess of the rate shown in the registration group.

Similar, if unequal, discrepancies are shown in the death rates from other diseases in the States which register deaths and the causes thereof and those which do not. Obviously there is no basis upon which to compute the relative frequency of any given disease in any given State. The best that can be done is to compare the death rates from given diseases in the baker's half dozen of registration States and the thirty-six registration cities.

There are no vital statistics worthy the name in the United States, as a whole.

BOOK NOTICES.

Text-Book of Abdominal Surgery. A Clinical Manual for Practitioners and Students. By SKENE KEITH, F.R.C.S., Ed., assisted by George E. Keith, M.B., C.M. With illustrations. Pp. 508. Philadelphia: J. B. Lippincott Company. Chicago: A. C. McClurg & Company. Price $4.50. 1894.

The book before us teaches fairly the existing state of abdominal surgery. It is divided in two sections. Section I comprises eleven chapters and is devoted to the surgery of the abdomen. Section II has five chapters, in which "the Surgery of the Abdomen Peculiar to Women" is discussed. The chapter on "Examination of the Abdomen" is especially valuable and interesting. We notice, however, that no reference to air inflation as a means of aiding auscultation is made. The air bag is so common an adjunct to our armamentaria in America that its omission seems strange. The book bears evidence on every page of the vast experience of the immortal Thomas Keith, under whom the authors practiced for seventeen years. It may, therefore, without much stretch of the imagination, be taken as coming from the master himself. The great candor, the simplicity of its style, and its direct statement are among the chief characteristics of the work. The advice as to measures in emergencies is sound, and the instructions on after treatment are such as may be implicitly followed. If we might venture an exception it is that the practice of the authors seems to encourage the administration of morphia to a degree not

usual in this country, and indeed quite unnecessary if we accept the dicta of some of our recent authorities. In controlling thirst where there is vomiting, we notice that our authors commend rectal injections of milk and water (page 79.) We commend the book as one destined to become a favorite.

Transactions of the Vermont State Medical Society for the Year 1893. Published by the Society.

This volume records the proceedings and papers of the eightieth annual meeting, which was held in Rutland, Oct. 12 and 13, 1893. One of the most interesting features of this meeting was the plea of the accomplished Secretary of the Society, Dr. D. C. Hawley, for a stronger organization. He recommended the members to rally around the standard of the AMERICAN MEDICAL ASSOCIATION, and the support of the JOURNAL, and volunteered to receive the annual subscription of any who desired to become members.

The prize papers for the year were respectively by Dr. O. W Sherwin, of Woodstock, on "Septicemia" and by Dr. E. M. Pond, of Rutland, on "Peritonitis." The President's address by Dr. H. R. Wilder, of Swanton, was an interesting one. The Vermont Society seem to have solved the problem of what to do with Vice-Presidents as they have here an excellent address by Vice-President Brewster, on "The Treatments of Phthisis Pulmonalis." He divides the treatment into three heads: 1. Prophylactic; 2. Medicinal; 3. Climatic. In the discussion which followed, the creosote treatment had several ardent advocates. There are many interesting papers in the volume and all are well written. A biographical sketch of the late Dr. Walter Carpenter, by Dr. Henry D. Holton, followed by a reprint of the constitution and by-laws, conclude the volume. Many societies have more pretentious transactions than this Green Mountain octogenarian, but few are of more solid worth or more carefully edited.

A Modern Wizard. By RODERIGUES OTTOLENGUI. New York and London: G. P. Putnam's Sons. Chicago: Brentano. 1894.

This novel has for its heavy villain a Dr. Medjora, a very learned physician, who hypnotizes people at will. He kills his second wife with cultures of diphtheria bacilli, and by means of a poison which he has discovered—"sanatoxine"—he makes himself a raving maniac to escape the consequences of his crime. He has, however, in the meantime carefully educated his son in hypnotic and other lore, and is firmly of the opinion that the son will discover the antidote to "sanatoxine" and then restore him to his senses. The "sanatoxine" Dr. Medjora has carefully prepared from the cerebral insanity center. The story is cleverly told, and from a detective standpoint is effective, but on the whole leaves a bad impression.

When to Send Patients Abroad for Water Cures and Climatic Treatment. By DR. THOMAS LINN. Detroit: George S. Davis. Paper, pp. 76. Price 25c. 1894.

This is one of the series of the Physicians' Leisure Library, as useful in its way as any of its predecessors. Since a certain class of patients must be sent or will go abroad anyway, to health resorts no better than those to be found at home, it is well to know where to send them and this knowledge Dr. Linn furnishes concisely and intelligently in this little hand-book.

NECROLOGY.

JACOB HART, M.D., of New York, at Ohiopyle.——Harold Groffe, M.D., of St. Paul, July 29.

SOCIETY NEWS.

American Electro-Therapeutic Association.—The following is the preliminary program of the American Electro-Therapeutic Association which will hold its fourth annual meeting at the New York Academy of Medicine, New York, September 25, 26 and 27.

President's Address—Dr. W. J. Herdman, Ann Arbor, Mich., Professor of Diseases of the Mind and Nervous System and Electro-Therapeutist in the University of Michigan.

REPORT OF COMMITTEES ON SCIENTIFIC QUESTIONS.

On Standard Coils—Dr. W. J. Morton, New York.

On Standard Meters—Dr. Margaret A. Cleaves, New York.

On Standard Electro-Static or Influence Machines—Dr. W. J. Morton, New York.

On Constant Current Generators and Controllors—Dr. W. J. Herdman, Ann Arbor, Mich.

On Standard Electrodes—Dr. A. Lapthorn Smith, Montreal.

Stand and Electrode for Static Electricity, exhibit of same, Dr. Lucy Hall-Brown, Brooklyn, N. Y.

On Electric Light as a Therapeutic and Diagnostic Agent, Dr. Margaret A. Cleaves, New York.

THE CONSTANT CURRENT.

Physics; Current Distribution—Mr. W J. Jenks, M.I.E.E., New York.

Physiologic Effects—Prof. H. E. Dolbear, President Tufts College, Boston, Mass.

Therapeutic Uses; General—Dr. A. D. Rockwell, New York.

Gynecology, The Galvanic Current in Catarrhal Affections of the Uterus—Dr. G. Betton Massey, Philadelphia.

Suites e'loignees du Traitement Electrique Conservateur Gynecologie. Grossesses consecutives—Dr. Georges Apostoli, Paris.

Metallic Electrolysis—M. le Docteur Georges Gautier, Paris; Dr. W. J. Morton, New York; Dr. Margaret A. Cleaves, New York; Dr. A. H. Goelet, New York.

Treatment of Urethral Stricture, Report to date—Dr. Robert Newman, New York.

Diseases of the Eye, Electro-Therapeutics of—Dr. L. A. W. Alleman, Brooklyn, N. Y.

Notes on Goitre and Improvements in Apparatus for Treatment of same—Dr. Chas. H. Dickson, Toronto.

Diseases of the Throat—Dr. D. S. Campbell, Detroit, Mich.

The Action of Electricity on the Sympathetic—Dr. A. D. Rockwell, New York.

Diseases of the Nervous System, The Treatment by the Galvanic and Faradic Currents—Dr. Landon Carter Gray, New York.

Electric Sanitation—Prof. John W. Langley, Ph.D., Case School of Science, Cleveland, Ohio.

Physics of the Electric Light in Relation to Organized Matter—Prof. John O. Reed, Ph.M., Assistant Professor of Physics, University of Michigan.

Hydro-Electric Methods, Physics and Appliances—Mr. Newman Lawrence, M.I.E.E., London.

Special Hydro-Electric Applications—Dr. Margaret A. Cleaves, New York.

The Hydro-Electric Therapeutics of the Constant Current—Dr. W. S. Hedley, Brighton, England.

INDUCTION CURRENTS.

Interrupted Currents, Physiologic Effects—Dr. W. J. Engelmann, St. Louis, Mo.

Therapeutic Uses; General Faradization—Dr. A. D. Rockwell, New York.

Gynecologic—Dr. A. H. Goelet, New York; Dr. H. E. Hayd, New York; Dr. A. Lapthorn Smith, Montreal.

SINUSOIDAL CURRENT.

Physics—Mr. A. E. Kennelly, F.R.A.S., Philadelphia.

Physiologic Effects—Dr. W. J. Herdman, Ann Arbor, Mich.; Dr. J. H. Kellogg, Battle Creek, Mich.

Therapeutic Uses—Dr. Margaret A. Cleaves, New York; Dr. Wm. Jas. Morton, New York; Dr. J. H. Kellogg, Battle Creek, Mich.; Dr. Holford Walker, Toronto; Dr. A. H. Goelet, New York.

Le Courants Alternatifs; Leur Transformation; Leur Mesure et Leurs Applications Therapeutiques—M. le Docteurs Gautier et Larat, Paris.

On the Sinusoidal Current Method of Regulation, the E. M. F. and Resultant Current—Dr. Lucy Hall-Brown, Brooklyn, N. Y.

STATIC AND STATIC INDUCED.

Physics—Prof. Edwin Houston, Ph.D., Philadelphia.

Therapeutic Uses, General Therapeutic Uses—Dr. Wm Jas. Morton, New York.

The Treatment of Chorea—Dr. D. R. Brower, Chicago.

Static Induced—Dr. Margaret A. Cleaves, New York.

High Frequency Currents derived from Static Machines as per Method d' Arsonval—Dr. J. H. Kellogg, Battle Creek, Mich.

IN MEMORIAM.

Dr. Wm. F. Hutchison, Providence, R. I., and Dr. John Chambers, Indianapolis, Ind.—Dr. Robt. Newman, New York.

Dr. Plymon S. Hayes, Chicago—Dr. W. J. Herdman, Ann Arbor, Mich.

PUBLIC HEALTH.

A Summary Proceeding.—Upon the motion of the Indiana State Board of Health thirty-three of the principal citizens of Whiting, Ind., have been arrested under an indictment for maintaining nuisances prejudicial to the public health, and a summons has been served upon the Standard Oil Company in an action alleging that it allows impurities to flow into Lake Michigan, thus polluting the water supply of adjacent towns and cities.

Intensification of Measles.—The London *Lancet* sees, in the increased mortality from measles during the past decade, ground for believing that the disease is undergoing an intensification of type and regrets, in the interest of preventive medicine, the diverse views which obtain among the several sanitary authorities who have added measles to the list of notifiable diseases as to the value of the proceeding. "A disease which in this country exacts a death toll of from 6,000 to 14,000 persons annually, and an uncertain but far from insignificant amount of partial disablement for life, can not be a matter of indifference to us," more especially in view of the increased death rate noted.

Boston and Philadelphia.—In a popular article in the *Forum* for July, presumably based upon special census reports, the relative mortality rates of Boston and Philadelphia are discussed. Contrary to the usual rule that the larger a city the higher its death rate, Boston had, in the census year, an average mortality of 23.59 per thousand, while Philadelphia had a death rate of only 21.86. Some of the causes leading to this are the lower average level of the site of Boston, the larger proportion of foreign-born inhabitants and the greater density of population. Concerning a factor of urban mortality, upon which the JOURNAL has heretofore dwelt, it is noted that "the low proportion of tenement houses in Philadelphia, and the fact that in that city each family, as a rule, occupies a separate dwelling, has a powerful influence in reducing mortality." Whatever of consolation the citizen of "the Hub" may derive from the comparisons in the article is to be found in the statement that "the man who lives in his own house in Boston has as long an expectation of life for himself and his family as the man under similar circumstances in Philadelphia."

Heat and Health.—What is claimed to be the hottest season on record does not seem to affect injuriously the public health. On the contrary, except in isolated localities, the summer death rate from the seasonal diseases is believed to be below the average. On the other hand, there is an unusual number of deaths from insolation—seven deaths in one day being attributed to this cause in Philadelphia—from violence, and especially from suicide. Theorists, who have heretofore speculated on the thermal relations of crime and other sociological factors under the alliterative titles of "Sun and Sin," "Heat and Hades," etc., may find further data for their excogitations in the records of the present summer. Possibly they may trace some connection between the present delay in tariff legislation and the temperature of Washington. Certain it is that never before have our National legislators been called on to endure a more momentous session under more trying seasonal conditions. Senators McPherson, Voorhees and Vest of the upper house alone, are already reported as invalided—the first from the unspeakable ventilation of the Capitol, the second from a chronic ailment aggravated by the same cause, and the last by an erysipelas said to be due to the notoriously unhealthy environment of the District in hot weather. There are reasons other than political why Congress should make haste to adjourn.

"Newspaper Cholera."—A Chicago daily paper (the *Mail*) furnishes intrinsic evidence of reading the JOURNAL to good purpose. In a recent editorial under the above heading it says: "The usual deaths from 'genuine Asiatic cholera' are taking place—in the newspaper columns; there was one yesterday at Meredosia, in Illinois, another at a whistling station, somewhere in Indiana, and still another at Confederate Crossroads, Ky., or some other equally likely locality. There is little excuse for these efforts of the imagination this season; surely there has been thus far no dearth of legitimate sensational news that it should now be necessary to conjure up a conjunction of cholera and Congress. As a matter of fact this country has rarely been favored with so healthful a summer season as the present. Except in New York and one or two other unfortunate localities, where sickness and the death rate have been swelled by excessive heat, there is a remarkable paucity of the usual seasonal diseases, and there is nothing threatening in the health conditions abroad. There is hardly cholera enough to 'go round' in Europe, and the plague is subsiding in Canton and Hong Kong; while health authorities, both in this country and elsewhere, were never before so vigilant, so well informed, nor so thoroughly equipped for efficient service."

Should We Vaccinate?—"Ought we to continue to vaccinate if we can not give a scientific why and wherefore for our work?" is the question which the *Hospital* (London) essays to answer. And it answers, Yankee fashion, by asking other questions. "Ought a baker to bake bread, and his customers to eat it, if he can not give a scientific demonstration of the process of fermentation which takes place in the dough? Ought a farmer to sow corn who is not able to explain the chemico-physiologic process of the development of the radicle and the plumule?" Facts and empiricism, arts and manufactures, all take precedence of science in the order of human development; and we must test vaccination as we do other matters for which, as yet, we are unable to give a scientific explanation—that is, ask of vaccination this question of questions· "What has it done in the world?" And the answer is, that it has defeated in open conflict one of the deadliest enemies of mankind and has put us upon lines of investigation which may yet rob all pathogenic organisms of their terrors. If such should be the grand result it is obvious that the mind of man, by as much as it is delivered from ignoble bodily fears, by so much it will rise to greater and greater heights of boldness and intellectual achievement. "But medical men, as the custodians of the science as well as of the art of healing, must constantly remember that vaccination and inoculation can never achieve these magnificent results until they are firmly established upon a basis of scientific reason as well as upon a foundation of solid and unchallengeable fact."

Foreign Epidemic Diseases.—Asiatic cholera continues to manifest itself with sufficient frequency and in localities enough to keep the sanitary authorities of Europe on the alert. The Prussian Commission of the Vistula basin reports

twenty-two deaths from cholera and eleven new cases of that disease during the week ended July 28. The sickness was mostly among laborers and raftsmen. At Emmerich, on a Rhine vessel towed from Holland, the Health Commission found a cholera patient. A strict river inspection has been instituted at Dusseldorf and Cologne. Suspicious cases have been reported from Granberg, Thorn, and Bohnsack. The Cholera Commission of the Health Office met at Berlin, July 28, to decide upon the precautions to be taken along the Russian frontier. The pioneer and pontooning exercises of the military on the Vistula have been postponed as a precaution against cholera. A dispatch from Travemuende, Germany, says a stoker of a steamship, arrived there from St. Petersburg, died July 30 from cholera. The Governor of Warsaw has forbidden the usual pilgrimage to Czenstochav on account of the prevalence of cholera. The Spanish Consul at Marseilles, having telegraphed that cholera is epidemic at that place, the number of deaths very large and the authorities concealing the actual situation, the Government has ordered stringent precautions to be taken at all Spanish ports on the frontiers. A medical commission has been sent to Marseilles with instructions to report the facts. And so on *ad infinitum;* all of which redounds to the benefit of this country, inasmuch as these items are made the text for sermons in many keys by the daily press on the virtues of sanitation and the necessity for "cleaning up," and inspire such utterances as this from New York:

"The existence of Asiatic cholera in European seaport cities and the ravages of the plague in China do not cause the least uneasiness to the officials of the health department here. The rules regarding the inspection of immigrants before they sail are now enforced, and it is next to impossible for cases of cholera to find their way aboard ships."

"Won wek" the bubonic plague, seems to be dying out in China, but its ravages have by no means been overestimated; a "blue book" issued, July 28, by Sir Walter Robinson, English Governor of Hong Kong, says that 120,000 people died from the disease in the Canton district alone.

MISCELLANY.

Change of Address.—Dr. A. P. Ohlmacher, of Cleveland, has removed to 54 Fifth Avenue.

Illness of Bismarck.—A Berlin cable of the 30th ult., announces that Prince Otto von Bismarck is suffering from an attack of prostration from the heat which was intense everywhere throughout Germany. Since the Prince is in his eightieth year much solicitude is felt for the result.

Another Woman Honored.—Dr. Jessie M. Weston, one of the graduates of the Woman's Medical College of Philadelphia in 1893, has been elected to the medical staff of the Connecticut State Hospital for the Insane at Middletown, occupying the only medical position which the Nutmeg State government has thrown open to women.

Pest-House Site Purchased.—The city of Chicago has just acquired title to a tract of ten acres within the city limits whereon to erect a contagious-disease hospital. The city architect, Mr. Finkler, has prepared elaborate plans for a model construction upon the site. The price paid for the land is $20,000.

Studying Hospitals.—Drs. John Osterman, G. F. Edenbailer and F. G. Scherer, Indianapolis, J. L. Carson, Fairland, and Z. H. Hauser, Columbus, all of Indiana, are making a study of hospitals in the leading cities for the purpose of obtaining information for the use of the Indiana State Board of Health. They visited the hospitals of Chicago early this week.

Bacillus of the Plague.—Rival discoverers of the bacillus of the bubonic plague are already announced. Kitasato, the Japanese pupil of Prof. Koch, claims to have identified the microbe as first cousin to the cholera vibrio—but, according to the newspaper accounts, it is a "slender, short bacterium," totally unlike the spirillum of Koch. A Dr. Ericcson, practicing among the French residents of Hong Kong, has also isolated the "simon pure" plague germ. Meanwhile the bacteriologic world awaits "a bill of particulars."

"Caprination."—At the suggestion of Dr. Daniel F. Wright, of Clarksville, member of the Tennessee State Board of Health, the Paquin Vaccine Laboratory at Columbus, Mo., is conducting a series of experiments with a view of determining the relative merits of the cow and the goat for the production of anti-variolous virus, on the theory of the immunity of the latter animal from tuberculous and syphilitic infection. In his letter Dr. Wright says: "I think it important that the words 'vaccine' and 'vaccination' should not be used in reference to the new inoculation, but 'caprine' and 'caprination.' 'Vaccine' being derived from 'vacca,' the Latin word for the cow, would be inappropriate for an operation in which the cow is not used at all; 'caprine' and 'caprination,' derived from 'capra,' a she goat, being the proper substitutions." How about the anti-cholera "vaccination," *et id genus omne?*

A Peculiarity of Messages Relating to Sickness or Death.—It is usually the duty of every person who would hold another responsible for the consequences of an act to give him such notice as will put him on his guard. Telegraph companies frequently escape liability for damages resulting from errors in the transmission of messages, or unjustifiable delay in delivering same, because there was nothing in the messages to put them on notice that such damages would ensue. But the Court of Civil Appeals of Texas holds, in the case of the Western Union Telegraph Company v. Porter, dec ded May 3, 1894, that when the general nature of a communication is plainly described by its terms, and when it relates to sickness or death, if the agent receiving such dispatch desire information about the relationship of the parties concerned he should seek it from the sender, and, if he fail to do so, his principal is charged with the information which inquiries would have developed.

Women as Sanitary Inspectors.—Dr. Moreau Morris, of the New York City Board of Health, is quoted in the New York *World* as having the utmost confidence in women of medical attainments as sanitary inspectors. Dr. Frances G. Deane has had two years' experience as a member of the sanitary corps, and Drs. Alice Mitchell and Helen Knight have recently been appointed to similar positions. Dr. Morris believes "that the fact of their being women will enable them to get into the homes of the poor where a man would be received with suspicion. The work that these women are engaged in is not the easiest, consisting as it does of a thorough canvass of the tenement houses in the district set apart for their work. They must visit every room, inspect sinks, peep into closets and climb innumerable stairs. Then, too, the people the sanitary physicians come in contact with are very apt to eye with displeasure the intrusion of strangers. On the whole, the work of the woman doctors of the Health Board is undeniably hard."

Rules Concerning What Patients Tell Experts.—The established rules of evidence, it is well-known, exclude hearsay testimony. As a consequence, the physician who makes an examination, as an expert, for the purpose of giving testimony in a case, will not, as a general thing, be permitted to state what the patient told him in reference to the specific cause of the injury giving rise to the litigation. But there is another rule, which is just as well settled: the United

States Circuit Court of Appeals holds, in the case of the Union Pacific Railway Company v. Novak, decided April 2, 1894, that the physician may testify to what the patient said in describing his bodily condition, and the character and manifestations of his pains, when such statements become necessary to enable the physician to give his opinion as an expert, on account of the latent nature of the facts to be proved by it. The action or non-action of the internal organs can not readily be seen. In such cases the statement of the injured party is ordinarily admissible, in order to enable the expert physician to determine the real nature of the trouble at the time of the examination.

Power of Indiana Township Trustee to Employ Physicians.—The township trustee is by statute in Indiana the overseer of the poor. He has no power to make a contract binding upon the county, when the board of commissioners has employed a physician for the purpose of treating the poor of the township, except in cases of emergency. But the Appellate Court of that State holds, in the case of Board of Commissioners of Lawrence County v. McLahlon, decided May 16, 1894, that in the event the board of commissioners of the county fail to employ a physician, or make suitable provision for them, in sickness, the trustee may do so, and the county will be liable therefor. And it further holds that although it appeared from the evidence that the board of commissioners had employed a physician for a certain township, who was acting in that capacity at the time the services in suit were rendered, yet if it was true that this physician lived seven miles from a poor person requiring attendance, that the physician was old, and in ill health and unable to attend, the trustee had power to employ a physician, and the county would be liable for the services rendered.

For the Medical Student.—As an antidote to that plea for the unfit,[1] in which the hardships that the medical student suffers under the present curriculum of medical colleges is portrayed, pray regard the following regimen for the summer interregnum—mark you—prescribed by Dr. E. R. Axtell incumbent of a chair in the Medical Department of the University of Colorado:

"On every week day you are to rise at 6 A.M. One hour is given for the toilet and for breakfast. On Tuesdays, Thursdays and Saturdays, the days on which you recite, review your lesson from seven until seven forty-five. If you recite from eight to nine, walk to the place of recitation, and after it is over return to the room at once and study until twelve. From twelve to one get your noon-day meal, which under the schedule I am giving you should be the main meal of the day. From one to two in the afternoon you should go to bed. Do this in earnest. Throw off your clothes, don some cool sleeping gown and darken the room. Your alarm clock will tell you when it is two o'clock. From two to five you study. From five to six you exercise. Walk, ride, use some Indian clubs, box or wrestle. Some of the greatest tussles of my life occurred between my room-mate and myself, between the hour of five and six. Supper is taken from six to seven. Then a rest until seven thirty. Then study until ten. Go to bed at once."

The Professor rather naively adds: "This advice I am free to say I did not always follow, but it is good advice." And the average student will follow the example rather than the precept of the Professor.

Another Strychnin Antidote.—In the *Archives de Physiologie*, 1894, p. 32, M. G. Grigorescu announces that in the course of some experiments to determine the action of toxic substances upon the excitability of peripheral nerves and muscles he has developed the fact that butyl-chloral opposes the toxic action of strychnin. He found that if injections of strychnin were made (in frogs), those which received also the butyl-chloral remained torpid, while those with strychnin alone were tetanized. After some hours the butyl-chloral was eliminated, and then these frogs were seized with tetanus, as were the others. On repeating the antidote up to the elimination of the strychnin, complete cures resulted. The observations demonstrate that butyl-chloral energetically opposes its physiologic action to the physiologic action of strychnin.

Hyrtl's Law.—"Damning with faint praise" is a feeble characterization of the effort of Dr. Thomas Dwight[1] to sustain the law of Hyrtl, that "the manubrium of the female sternum exceeds half the length of the body, while the body of the male sternum is, at least, twice as long as the manubrium." In his, as yet unpublished, observations, Dr. Dwight has found that in 342 sterna—222 male and 120 female—there were almost precisely 40 per cent. of exceptions to this law. And yet this conservative anatomist affirms that "the averages of my measurements confirmed that law, but—that the exceptions were equal to the cases in accord with it." (The JOURNAL inserts the dash for the purpose of emphasizing the exceptions.) What Prof. Dwight says, in effect, is that while Hyrtl's "law," as to the sternum in the identification of the sex of a given skeleton is correct, it would fail in two cases out of five. A judgment based upon Hyrtl's law as thus confirmed would hardly do to go to a jury of the average American citizen. The odds are not enough.

The Physician's Wife.—In a notice of "The Physician's Wife," by Ellen M. Firebaugh, the reviewer of our contemporary, the *British Medical Journal* (July 14, inst.) pays the following tribute to the American wife of one physician:

"If France may claim to have founded the school of realistic romance, in which the passions, the crimes and the vices of life are exposed with the ruthless veracity of the dissector, to America belongs the honor of having developed that daintier and more delicate style of realism in literature, in which the common everyday life of common everyday persons is portrayed with such sympathy and intimate knowledge of circumstance that all who read feel the truth of the description. The physician whose life the wife illustrates with such delicate touches and an art which simulates simplicity, is no hero of romance nor worker of miraculous cures; he is only the country doctor whom we all know, who may be seen any day driving in his gig from house to house, giving friendly nods to passersby, or who wends his way night after night along the dark lanes under the stars to carry aid to a distant sufferer. But the sympathy of his wife makes us henceforth better understand his long toilsome days, his broken nights, his disappointments, his sense of the world's ingratitude, his loving service of others. His wife quietly notes it all; she misses none of the humor and pathos, and even the doctor himself does not escape her gentle irony."

The book must be worth reading.

Power of Court to Exclude Non-Expert Opinions as to Sanity.—One of the instances where non-expert witnesses may express their opinions is on questions of sanity. But their right to do so is not unrestricted. In the case of Denning v. Butcher, decided by the Supreme Court of Iowa May 25, 1894, it was insisted that all that is necessary to qualify the witness is a statement of the facts and circumstances upon which his opinion is founded, and their sufficiency can not be questioned. The right of a non-expert witness to give an opinion based upon facts fully disclosed to the jury has always been recognized, says the court; but, it adds, It is equally clear that the trial court has the right to determine whether such facts have been disclosed as to entitle the witness to express an opinion. That is a preliminary question and a power which must be possessed by the court, else

[1] JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, June 23, 1894 p. 960.

[1] The Shattuck Lecture for 1894, on "The Range and Significance of Variation in the Human Skeleton," delivered before the Massachusetts Medical Society, June 12, 1894.

such a witness, on stating a single fact of such a character that no opinion of sanity or insanity could properly be based thereon, would be permitted to give his opinion as to the party's mental condition. True, it may be impossible to lay down a rule as to just what statement of facts would show a sufficient foundation to warrant the giving of an opinion by a non-expert witness. That must depend upon the circumstances of each case, and must be left for the trial court to determine in the exercise of a wise legal discretion; and its ruling in that respect should not be disturbed, unless it clearly appears that it has not properly exercised the discretion with which it is vested.

Allowances for Autopsies.—The case of Moser v. Boone County as decided by the Supreme Court of Iowa May 18, 1893, was reviewed at length in the JOURNAL of July 15, 1893, (Vol. xxi, pp. 97, 98), on account of the remarkable position which the Court there took. It held, it will be remembered, that, under the amended statute of the State, the compensation allowed by the county board of supervisors to physicians or surgeons summoned by the coroner to make a scientific examination at an inquest is conclusive, in the absence of fraud, and that a physician is not entitled to maintain an action to determine whether his services are not in fact worth more than the amount allowed.

From this position the Court has now receded. It granted a re-hearing, and May 23, 1894, rendered its second, and more satisfactory decision. The two cases before relied on to support its determination, it now points out arose before the Code was amended, and are not conclusive on the principal question. The claim for services rendered under the law as amended, it holds, is not liquidated when it is presented to the board of supervisors for allowance. That board has power "to examine settle, and allow all just claims against the county unless otherwise provided by law." Ordinarily, it continues, the action of the board on an unliquidated claim is not final, but suit may be brought thereon after it has been presented to the board as the statute requires. For these and other reasons, the Court now holds that it is the duty of the board of supervisors to allow a reasonable compensation for such services, and that, if it does not, the physician or surgeon who renders them has a right to collect such compensation by an action against the county.

More Newspaper Medicine.—A London, England, dispatch speaks of an American found dead recently in the slums of Glasgow, at whose post-mortem examination it was found that "the body showed that he had died of fright." Whereupon our esteemed contemporary, the *New York Medical Journal*, expresses a desire to learn what the post-mortem signs of fright are, and adds that newspaper medicine is almost always amusing, but generally without intention. An entertaining example of intentional humor in connection with medical matters was given in an editorial article recently published in the New York *Times*, in which the writer evolved a theory of the American tendency to use middle names. He says: "The middle letter made its appearance in America immediately after the first great epidemic of influenza. We may therefore feel reasonably certain that it was one of the innumerable sequelæ of that exasperating disease. It attacked nearly every boy and girl in the country, and in most cases assumed a chronic form. The recent epidemic of influenza, which has for the last five years devastated the noses and throats of America, has been followed by the development of the middle name in full, and this in its turn will become chronic. The fact that the middle letter appeared in England before the influenza merely shows that so far as Englishmen are concerned, the two have no relation to each other. When, on the other hand, we find that immediately after a severe attack of influenza Mr. W. D. Howells becomes 'William Dean Howells,' and Mr. James W. Riley becomes 'James Whitcomb Riley,' it is impossible that we should fail to see that these facts stand to each other in the relation of cause and effect."

Abandonment of Sidney Barracks, Nebraska.—During the past ten years a change has been taking place in the character of the military posts of this country. At the close of the War of the Rebellion the regular Army became scattered over the Western Territories in small commands of one or two companies to protect settlers from hostile Indians. These commands, when not in tents, were usually housed in poorly constructed huts of adobe, logs, or boards. The country furnished the material in the rough and the soldiers the labor, so that but little money was expended in providing shelter for the troops. The water supply was wagoned in barrels from the neighboring creek or river; waste water sank into the ground or ran off its surface according to the porosity or inclination of the site, and sewage was deposited in pits as in the temporary camps of active service. A few years later as railroads opened up communication, the necessity for many of these posts ceased and the troops were concentrated at railroad centers where they could be dispatched to various points as occasion required. At most of these larger posts excellent barracks have been built of brick or stone, well lighted and ventilated, provided with free supplies of pure water and with satisfactory arrangements for the disposal of waste water and sewage.

Sidney Barracks, Nebraska, has recently been added to the list of abandoned posts. Troops camped on its site in 1867 to protect the line of the Union Pacific Railroad, and two years later accommodations were completed for a troop of cavalry and a company of infantry. On account of its position on the line of rail, the buildings at this post were superior to most of those constructed in the West at that period. They consisted of frame buildings, lathed, plastered, ceiled, shingled and ventilated by shafts through the roofs. The site was on Lodge Pole Creek, about forty miles above its junction with the South Platte River. The Creek is a small stream running through the arid plains of Wyoming and Nebraska in a valley one or two miles wide, with sandstone bluffs about seventy feet high on either side. Outside of the valley the general appearance of the country is that of a vast undulating plain unbroken by trees or high grounds. An irrigating ditch carried a plentiful supply of clear water from the Creek through the post and the adjoining village of Sidney, and permitted the growth of box elder and cottonwood as an attractive feature of the locality. A post garden furnished an abundant supply of vegetables and the hunters of the command kept the messes generally supplied with venison. The post has been a healthy one during the twenty-seven years of its existence; and as its postal, telegraph, supply and travel ng facilities were good, it has always been regarded by the medical officers as one of the better class of stations in the country of the Platte River.

Not a Candidate for Congress.—The editor of this JOURNAL is not a candidate for Congress as announced in various contemporaries. His name will not be mentioned in the convention which will be held on this date. The editor, however, can not refrain from expressing his sincere thanks to those of his contemporaries who have kindly and favorably noticed his candidacy as announced in the secular press.

Hospital Notes.

NEW HOSPITAL, ELGIN, ILL.—The new hospital at Elgin, Ill., for infirm male patients, was opened July 23, with thirty-two inmates.

INVESTIGATE MINNESOTA INSANE HOSPITALS.—The report of the Board of Physicians appointed by the Governor of Minnesota to investigate the insane hospitals of the State, favors the establishment of a separate hospital for epileptics, and also the building of another insane hospital, to be located near St. Paul and Minneapolis.

MINNEAPOLIS CITY HOSPITAL.—City Physician Weston has appointed the consulting staff of physicians for the City Hospital. None but regulars have a place on the Doctor's list.

The appointment of the staff settles a vexed controversy, several irregulars having applied for appointment.

Following is the list:

Physicians—J. H. Stuart, M.D.; W. P. Spring, M.D.; C. L. Wells, M.D.; C. J. Ringneil, M.D.; H. B. Sweetser, M.D.; J. W. Bell, M.D.

Surgeons—W. A. Hall, M.D.; J. W. Little, M.D.; C. G. Weston, M.D.; J. H. Dunn, M.D.

Obstetrics and Children—A. B. Cateo, M.D.; P. M. Holl, M.D.

Nervous and Mental—W. A. Jones, M.D.; L. M. Crafts, M.D.

Pathologists—J. C. Stewart, M.D.; A. F. Irwin, M.D.

Gynecology—A. W. Abbott, M.D.; F. A. Dunsmoor, M.D.; F. R. Woodard, M.D.; W. G. Byrnes, M.D.

Eye and Ear—Frank Allport, M.D.; C. J. Spratt, M.D.

Washington Notes.

THE MEDICAL DEPARTMENT OF THE COLUMBIAN UNIVERSITY.—The announcement for 1894 and 1895 is just published. The clinical facilities have been greatly increased and at a meeting of the clinical professors last week many important matters were arranged. Practical instruction will be the watchword.

DR. H. L. E. JOHNSON in charge of the Department of Women's Diseases, has organized a maternity service for the purpose of giving clinical advantages to medical students and young graduates.

THE CENTRAL DISPENSARY AND EMERGENCY HOSPITAL.—Three hundred emergency cases were treated in the hospital during the month of July. Many operations were required including abdominal section. The unfinished wards have been completed and furnished and will greatly increase the usefulness of the institution. The annual report to June 30 shows a large icrease over last year's work. Miss West, the Superintendent, has found by experiment that the asphaltum and artificial stone floors can be rendered aseptic, whitened and made to look new by washing them first with a saturated solution of permanganate of potash and then, while wet, with a saturated solution of oxalic acid in water. This is inexpensive and does not injure the floors.

THE COXEY AND INDUSTRIAL "ARMIES" which have located in the outskirts of the city number about one thousand and more are expected in a few days. Their condition is deplorable to the highest degree. During this heated season without shelter and badly clad they are eking out a most vicarious existence, depending for food upon a few berries picked from the fields and "threadbare" charity. On account of the unusually large number of persons who belong here who have to depend upon charity, much less can be given to the "army" and they can hardly keep body and soul together. Why these poor deluded creatures continue to come here, or remain after they arrive and see the condition of affairs, is beyond human mind to explain. Sooner or later this persistent violation of hygienic laws must be followed by some grave epidemic which will carry off a large number of them, previously weakened and debilitated. What degree of immunity other citizens will have, is a mere conjecture.

THE PUBLIC SERVICES.

Army Changes. Official list of changes in the stations and duties of officers serving in the Medical Department, U. S. Army, from July 21, 1894, to July 27, 1894.

Major CURTIS E. PRICE, Surgeon, order assigning him to duty at Ft. Custer, Mont., is revoked, and he is granted leave of absence for one month, to take effect upon being relieved from duty at Ft. Porter, N. Y. By direction of the Secretary of War.

Navy Changes. Changes in the Medical Corps of the U. S. Navy for the week ending July 28, 1894.

Medical Inspector B. H. KIDDER, ordered as member of Board of Medical Examiners, Navy Department.

Surgeon C. G. HERNDON, detached from Board of Medical Examiners, Navy Department.

Surgeon G. P. BRADLEY, detached from receiving ship "Wabash," and to the Navy Yard, Mare Island, Cal.

P. A. Surgeon E. P. STONE, detached from Marine Recruiting Rendezvous, Boston, and to the "Wabash."

Surgeon F. B. STEPHENSON, ordered to the Marine Recruiting Rendezvous, Boston Mass.

Marine-Hospital Changes. Official list of changes of stations and duties of medical officers of the U. S. Marine-Hospital Service, for the four weeks ended July 21, 1894.

P. A. Surgeon D. A. CARMICHAEL, granted leave of absence for thirty days, July 20, 1894.

P. A. Surgeon A. H. GLENNAN, to inspect unserviceable property at Delaware Breakwater Quarantine, July 6, 1894.

P. A. Surgeon W. D. BRATTON, to report at Bureau for temporary duty, June 27, 1894.

P. A. Surgeon J. J. KINYOUN, to proceed to Cape Charles Quarantine for special temporary duty, June 30, 1894. Designated to represent Department at International Congress of Hygiene and Demography, July 9, 1894. To inspect unserviceable property at Boston, Mass., July 17, 1894.

P. A. Surgeon H. D. GEDDINGS, to report at Bureau for temporary duty, July 20, 1894.

P. A. Surgeon C. P. WERTENBAKER, to proceed to Delaware Breakwater Quarantine for special temporary duty, June 30, 1894.

P. A. Surgeon G. B. YOUNG, to inspect quarantine stations, July 20, 1894.

PROMOTION.

Asst. Surgeon B. W. BROWN, commissioned as Passed Assistant Surgeon, July 19, 1894.

LETTERS RECEIVED.

(A) Anglo-Swiss Condensed Milk Co., New York City; Ancker, A. B., St. Paul, Minn.; Adams, J. F. A., Pittsfield, Mass.; Andrews, B. J., Burlington, Vt.; Ayer, Washington, San Francisco, Cal.; Atkinson, Wm. B., Philadelphia, Pa.; Andrews, Edmund, Chicago, Ill.

(B) Brown, Charlotte B., San Francisco, Cal.; Baughman, J. N., Flat Lick, Ky.; Brick, P. L., Le Mars, Iowa; Bates & Morse Advertising Agency, New York City

(C) Canfield, Wm. B., Baltimore, Md.; Comegys, C. G., Cincinnati, Ohio; Caples, Byron M., Wauwatosa, Wis.; Cooper, Wm. C., Troy, N. Y.; Cincinnati Sanitarium, College Hill, Ohio; Crawford, M. H., San Francisco, Cal.; Cutter, John A., New York City.

(D) Doliber-Goodale Co., Boston, Mass.; Denison, C., Denver, Colo.; Dunning, L. H., Indianapolis, Ind.

(E) Erwin, A. J., Mansfield, Ohio; Eaton, F. B., Portland, Oregon.

(F) Frazee, A. B., Kipple, Pa.

(G) Gedge, D. McC., San Francisco, Cal.

(H) Hofmann, J. A., San Francisco, Cal.; Hartz, Henry J., Detroit, Mich.; Hibberd, Jas. F., Richmond, Ind.; Hare, H. A., Philadelphia, Pa.; Huntington, T. W., Sacramento, Cal.; Hummel, A. L., (2,) Philadelphia, Pa.

(I) Ingals, E. F., Chicago, Ill.

(J) Jackson, W. R., Mobile, Ala.; Jenkens, J. F., Tecumseh, Mich.; Judson, A. B., New York City

(K) Keen, W. C., Glasgow, Ky.; Kerrick, H. C., Brocton, Ill.; Knox, S. P. B., Santa Barbara, Cal.; Keenan, D. M., Troy, N. Y.

(L) Lydston, J. A., Chicago, Ill.; Lee, J. F., Chicago, Ill.; Love, J. J. H., Montclair, N. J.

(M) Martin, W. A., San Francisco, Cal.; McNutt, W. F., San Francisco, Cal.; McBride, M. A., Leesville, Texas; Meade, S. J. D., Cincinnati, Ohio; Montgomery, D. W., San Francisco, Cal.

(N) Norbury, Frank P., Jacksonville, Ill.; Neff, J. H., Kalamazoo, Mich.

(P) Pennington H. V., London, Ky.; Porcher, F. P., Pineopolis P. O., S. C.; Parkhill, Clayton, Denver, Col.; Pierson, Allen, Spencer, Ind.; Price, M. F., Los Angeles, Cal.

(R) Rush Medical College, Chicago, Ill.

(S) Sanders Enno, (2,) St. Louis, Mo.; Smith, Q. C., Austin, Texas; Salixis Chemical Co., Boston, Mass.

(T) Tidd, E. J., Clark, Pa.; Tuck, W. O., Plymouth, Ill.; Topliff, C. L., New York City; Tray, J. L., Toledo, Ohio; Taylor, A. H., San Francisco, Cal.

(W) Woodruff, I., Alton, Ohio; Ward, R. C., Northfield, Mass.; Wricker, W. R., Shelby, Ohio.

(Z) Zeller, Geo. A., Peoria, Ill.

PAMPHLETS RECEIVED

A Case of Cysticercus of the Vitreous. By W. Cheatham, A.B., M.D., Louisville, Ky.

A Great and Growing Evil. By S. D. Van Meter, M.D., Denver, Col.

The Removal of Stone in the Bladder. By Wm. S. Forbes, M.D., Philadelphia, Pa.

Operative Treatment of Internal Hemorrhoids as practiced by American Surgeons. By Claude A. Dundore, M.D., Philadelphia, Pa.

An Act to Regulate Practice of Medicine and Create State Board of Examiners in Louisiana.

Errors in School Books. Boston: Pope Manufacturing Co. 1894.

"Chaucer's Doctour of Phisyk." Reprinted from the Bristol Medico-Chirurgical Journal.

Malarial Cachexia, Chronic Malarial Poisoning, Chronic Intermittent. By N. L. Guice M.D., Meridian, Miss.

Modern Cremation as a Means for Disposal of the Dead. By A. E. Regensburger, San Francisco.